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GUEST EDITORIAL

Early Diagnosis of Gastric Carcinoma

WE PHYSICIANS are perhaps justified in our pessimistic outlook regarding gastric cancer. It killed more men during World War II than were lost by direct enemy action. It is now killing more American men than are lost by enemy action in Korea. It is one of the most common cancers in both men and women. Five year survivals in the best clinics are less than 10 per cent. Recurrence is 80 per cent or more in the stump gastric bed and perigastric nodes after subtotal gastrectomy.

However, in the face of the common occurrence of gastro-intestinal carcinoma and its terriffic toll of human life, is each of us, as a physician, justified in doing little or nothing about the problem on the basis that there is little hope of improvement? Its very gravity, its prevalence, and its difficulty of early diagnosis constitute a challenge to us to make every effort to improve the outlook on life for victims of stomach cancer. To improve the survival rate by 10 per cent—in other words, to increase it from 10 to 20 per cent—would be a much greater contribution to human life and suffering than to cure 100 per cent of carcinomas of the pancreas or carcinomas of the liver. It would be a greater contribution than to cure all carcinomas of the kidney. This is so, merely because of the great difference in prevalence of the diseases.

There is no question but that radical surgery is the only possible effective treatment for this cancer. However, surgery for cure is futile unless it is applied very early; before metastases and extension beyond the confines of the stomach have taken place. Palliative surgery is necessary for comfort, but does not improve life expectancy.

Therefore, the only answer to our problem is early SUSPICION. Early diagnosis is impossible because there are *no symptoms and signs of early cancer of the stomach.* This should not be confused with *early signs of advanced cancer* which are the signs and symptoms usually described. Early cancer of the stomach rarely or never produces detectable specific signs or symptoms. Therefore, the problem resolves itself into a *search for suspicious evidence* of gastric pathology of almost insignificant importance. It is to be remembered that the gastro-intestinal tract is physiologically outside of our bodies much as is the skin. It is accustomed to the daily trauma of life and it responds paradoxically by easily acquiring the habit of complaint on a psychosomatic basis resulting in functional disturbances, but withstands presistent chronic trauma, which often leads to organic lesions, without producing a sign until the bleeding of deep ulceration, the obstruction of massive growth, or the pain of deep infiltration sounds an alarm, too late.

The urgent question which faces us is, how we physicians may contribute most effectively in surveying the population to discover those individuals who have *suspicious evidences* of trouble in the stomach. Obviously, it means careful examination and questioning of many individuals who are not cognizant of gastric abnormality. Clinics and detection centers have been found inadequate and inefficient for many reasons including the difficulty of obtaining proper staff for these centers, the drudgery of routine

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examination of more or less normal individuals, and of most importance, the unfamiliarity of these professional "strangers" with the individual patients. The practicing physician knows many of his patients and neighbors well enough to evaluate early complaints and slight symptoms and can do a much more effective job of differentiating between the functional disturbances with which he is so familiar and the more recent changes of habit, or acquisition of suspicious signs than can his colleague, who has no previous experience with the patient on which to base clinical judgment.*

An adequate program for a *search* of *suspicious* stomach abnormalities depends on examination of patients by their own doctor, and upon the willingness of every physician to participate actively in this "hunt". This is not as impossible a program as it may first appear. It can be done. It involves slight changes in attitude of mind and habits of practice. Each one of us must be not only cancer conscious but *alert to the importance of presumably insignificant signs and symptoms* which may only point suspicion at the stomach. We must be willing to increase our effort in periodically examining patients who present themselves in our offices not only for the presenting complaint, but to take the few moments necessary to question them concerning their stomach habits and perhaps to inquire about any change in the nature of their stools, and to examine their abdomen for evidence of slight abnormality.

To include the entire population of any given community would be impossible and is unnecessary. It is useless to search for evidence of gastric lesions in a child or a young adult. Although cancer does rarely occur in younger age groups, it is only common after the age of 45 and its prevalence increases rapidly as age advances. Therefore, the persons who should be questioned and examined can be narrowed down to a first group of 45 years and older, and, as one progresses with questioning and examination, the number of patients who need the next indicated procedure becomes smaller and smaller so that the physician's time and energy are conserved and yet his patient group is adequately covered. These persons of the limited age group should be carefully although quickly questioned concerning any *recent* onset of vague gastric uneasiness, a feeling of unusual fullness after eating which they did not note previously, or a slight indigestion and perhaps a loss of the desire to eat as much as they formerly did. Examination may elicit a slight sense of fullness or firmness in the epigastrium. There may be unexplained pallor which has occurred during the past few months. The patient may admit that he fatigues more easily than he had up to a few weeks or months previously. Such symptoms or signs are most important in their *index of suspicion* for trouble in the stomach if they are of more recent occurrence. In this regard, it is important that the examining physician be familiar with the patient's past history.

All this first group are entitled to a blood smear examination and hemoglobin determination for evidence of slight anemia. Any unexplained mild anemia, particularly of the macrocytic type, is a definite *suspicious sign*. The group now can be reduced considerably and further examination limited to the second category, those who have aroused suspicion on the part of the physician because of a complaint, slight anemia, or a physical finding which is unexplained. These patients must be submitted to a gastric analysis with examination of the cellular washings from the stomach and to gastrointestinal x-ray examination. Low or absent free acid after histamine is definitely suspicious of possible tumor. Gastric cytology has been found to be of little use unless it is obtained after the stomach has been thoroughly washed out and by far the best

*The physicians of Hillsdale County, Michigan, have developed and operated a very satisfactory cooperative periodic cancer detection plan for several years. See: The Hillsdale Plan for Tumor Detection; J. Mich. State Med. Soc. **48**:445 (1949).

results in diagnosis have been reported by Panico, Papanicolaou and Cooper*, who have introduced the method of balloon abrasive aspiration of material from the stomach. A small collapsed balloon secured around an ordinary Rehfuss tube is introduced into the stomach and inflated to the diameter of the stomach. After thoroughly washing out the gastric contents, peristalic activity is permitted to move the balloon to the pylorus. It is then withdrawn to the cardia and the procedure repeated four or five times. The balloon is then collapsed (permit escape of the air), withdrawn and washed in a beaker of saline. The washings are centrifuged and the button of cells prepared for examination either by paraffin infiltration and staining of sections, or by preparation of stained smears. In three years of experience with this method in New York Hospital†, Cooper reports a high correlation of positive findings permitting correct diagnosis before surgery. It is hoped that this procedure will become widely available in the near future because it certainly constitutes a great step forward in the early diagnosis of gastric lesions at a minimum of discomfort to the patient.

One must not be satisfied with a report from the radiologist of "no evidence of gastric cancer or obstruction". Remember that obstruction and shadow evidence of gastric cancer occur *late*. The x-ray fails to reveal a small lesion unless it is significantly ulcerated, fungated or happens to appear on the silhouette margin of the picture. The suspicious signs which you must ask your radiologist to report are those of thickening or hypertrophy of the rugae or decreased or asymmetric peristaltic activity of the different portions of the stomach. We have seen a patient whose only complaint was slight indigestion and whose repeated gastrointestinal x-ray examinations were negative except for "slight delay in gastric peristalsis and moderate hypertrophy of the rugae" for a period of six months at which time the symptoms were definite. Diagnosis of carcinoma of the stomach was readily made by x-ray and the patient was found inoperable. Exploration at the time of the first report of slight changes in the function and structure of the stomach might have resulted in successful radical removal.

With these examinations, positive findings have narrowed the group of patients to a small number for whom a *high suspicion* of gastric carcinoma must be entertained. Other studies may be done such as blood protein and AG ratio which occasionally reveal some disturbance but should not be relied upon for diagnosis. Blood protein changes often occur late in gastric carcinoma. The vitamin A level of the blood has been reported low in gastric carcinoma but again this is often quite late in occurrence and the procedure for determining the vitamin A level is difficult and not available in the ordinary clinical laboratory. Therefore the best approach when definite suspicion of gastric lesion has been established (by the above procedures) is clinical and one should consider the patient deserving of exploratory surgery. Only the microscope will reveal the nature of the lesion. Patients with diagnosis of gastric ulcer in this age group if not definitely and markedly improved by medical treatment in a period of three weeks should also be explored. Sometimes the peptic ulcer turns out to be carcinoma.

For patients who are under treatment with a diagnosis of pernicious anemia, the *suspicion index* for gastric carcinoma must be multiplied tenfold and they must be watched closely for signs of trouble in the stomach and operated immediately. Delay is disastrous.

At exploratory surgery, small lesions are easily missed. If the index of suspicion

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*Frederick G. Panico, George N. Papanicolaou and William A. Cooper: J.A.M.A. **143**, 1308 (1950)

†William A. Cooper. Reported at annual meetings, American Cancer Society, November, 1951.

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is sufficient for exploration, the patient then is entitled to *a look inside of the stomach.* Never be satisfied with a quick palpation. *Biopsy every abnormal area of the mucosa.*

Although there is certain skepticism found in our medical literature regarding successful surgery for gastric cancer even when applied relatively early, there is insufficient evidence to justify neglect. It seems reasonable to believe that the earlier the lesion can be completely and radically removed, the more chance the *individual patient* has of survival and the more chance, we, as a profession, have of increasing our survival rate for five years for under 10 per cent to much higher figures. Let us remember that each patient is entitled to the opportunity of being *the one* who may survive without recurrence or metastasis though the overall figure may be low statistically.

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ANNUAL MEETING

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ABDOMINAL TUBERCULOSIS WITHOUT EVIDENT TUBERCULOSIS OF THE LUNGS†

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The subject of this presentation is tuberculosis of the abdomen in which there is no evident tuberculous lesion in the lungs. This would include tuberculosis of the gastro-intestinal tract and peritoneum. It is evident that we cannot possibly cover the entire subject in the time allotted to us. We will only speak briefly of involvement of the G.I. tract.

Tuberculosis is a disease of antiquity. Hippocrates was aware that diarrhea in the terminal stages of phthisis was an ominous omen. The modern study of abdominal tuberculosis began with Rokitansky who in 1849 described tuberculous enterocolitis. In 1884 Koenig described tuberculous peritonitis and followed patients clinically[1].

Tuberculosis may involve any part of the gastro-intestinal tract, but the most common location is the ileocecal junction in 85% of the reported cases. Proximal and distal involvement from this point occur with proportionately decreasing incidence. It is stated that the incidence of intestinal tuberculosis in patients dying of tuberculosis is 60-90%. Blumberg in a study of pulmonary tuberculosis found x-ray evidence of bowel tuberculosis in 5-8% of early cases; 14-18% of moderately advanced; and in 70-80% of far advanced pulmonary tuberculosis[2]. Bockus[2] divided the disease into two main types:

1. Secondary ulcerative type, which is secondary to active pulmonary tuberculosis and is characterized by ulceration. A primary type was described in children during the first three decades of this century and was more common in England and Scotland. Ulcers may be longitudinal or circular. Healing occurs by fibrosis and at times with stenosis. Perforation with localized peritonitis may occur. The symptoms may be the same as those found in tuberculous peritonitis.

2. Hypertrophic or hyperplastic type occurs in the absence of pulmonary tuberculosis in 70% of cases (Davis)[2]. It was believed that the organism was an attenuated bovine strain. It is a very rare disease. An elongated tumor is formed in the ileocecal region. There is no ulceration. Symptoms are those of obstruction with a palpable tumor.

X-ray examination of the bowel in both of these types would reveal abnormalities, which, however, are not pathognomonic.

Lichtman[3] describes two forms of tuberculous infection of the liver, both of which are secondary to ulcerative intestinal tuberculosis in a great percentage of cases:

1. Generalized—miliary, as a part of a hematogenous dissemination. Infection occurs by way of the hepatic artery. The tubercles may heal and calcify.

2. Localized—tuberculomata or abscesses. These may be solitary or multiple. Infection occurs by way of the portal vein. Caseation and encapsulation may occur. In both these forms the liver may be enlarged and tender, but jaundice is rare.

There has been a steady decrease in the morbidity and mortality of all forms of tuberculosis in this country in the past fifty years. In 1900, it was 197 per 100,000, while in 1948, it was 30 per 100,000. Large series of routine autopsies have shown an incidence of tuberculous peritonitis in from 2.7 to 5.3 per cent[1]. Of the total tuberculosis deaths in 1948, 92.2 per cent were from tuberculosis of the respiratory tract and 7.8 per cent from the non-respiratory forms of the disease[4]. Edwards and Drolet[5], however, state that there was a widening gap between tuberculosis morbidity and mortality in this country between 1940 and 1947. Whereas the number of deaths decreased from 60,428 to 48,064, the number of new cases reported rose from 100,772 to 133,837. Tuberculosis has not been eliminated as a major cause

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of disability and death. It has been estimated that 20,000,000 people throughout the world are afflicted with this disease.

Milk from tuberculous cattle has in the past been a source of infection of the intestinal tract. Mayo[6] in 1929 stated that the bovine type was responsible for 25 per cent of tuberculous peritonitis in children. Auerbach[7] in postmortem examinations in a tuberculosis hospital found 90 instances of tuberculous peritonitis. He found that one-third of the cases had active tuberculosis of some portion of the urogenital tract and in another 25 per cent there was an association with skeletal tuberculosis. In some cases the origin of infection was difficult to explain.

Tuberculous peritonitis is more often found in the young to middle life, but no age is immune. The Negro race and females appear to be more susceptible. Primary tuberculous peritonitis has been described, but it appears to be only a remote possibility. The primary focus is usually an ulcerated bowel, an involved appendix, an infected fallopian tube, or a caseous retroperitoneal node. Peritonitis in these cases occurs by direct extension through the peritoneal membrane. A more distant organ as cervical lymph nodes, lungs, or joints may serve as the primary focus. Dissemination to the peritoneum may be by contiguity, by lymphatics, and by the blood stream (as part of a generalized spread). Three types have been described[1]: (1) Ascitic; (2) Adhesive; (3) Caseous.

In the earliest stages of spread to the peritoneum, numerous nodules 1 mm. in diameter or less are scattered over the entire peritoneal surface. There is an outpouring of peritoneal fluid with a specific gravity of 1.018 to 1.024. The amount of the fluid is small when compared to the ascites in cirrhosis of the liver. As the disease progresses, it may become an adhesive type with many agglutinated loops of intestine and omentum that form large masses. Actual obstruction of the bowel may occur. Another type of disease that may develop is a destructive caseous process. Caseous masses form and ulcerate with the development of intestinal fistulae. Any combination of the early exudative, the fibrous, and the caseous types may occur. The disease may not progress to the extensive fibrous or caseous type, but after a period the condition may slowly subside and the patient recover. Auerbach[7] quotes Lindner, Stubenbord and Spies, who reported cases of extensive, proven, peritoneal tuberculosis which without specific therapy showed fibrous thickening of the serosal surface but no evidence of tuberculosis on subsequent operation or autopsy. The mortality rate is unknown because the diagnosis is too often not suspected.

The symptoms of peritoneal tuberculosis are varied. The disease is usually characterized by a slow and insidious onset. At first, there is a vague sense of fullness or abdominal discomfort which may be intermittent. Later, there is definite distention and pain. The patient feels weak, runs an occasional low grade temperature, and may have diarrhea. Examination will probably show slight distention, shifting dullness, and abdominal tenderness. As the disease progresses, the symptoms and findings increase. The patient loses weight and strength, becomes anemic, and a chronic invalid. The onset may be acute with a high temperature, nausea, vomiting, abdominal distention and pain. These findings may lead to a diagnosis of appendicitis, cholecystitis or intestinal obstruction. An asymptomatic hernia which a patient may have had for many years becomes thickened, painful and difficult to reduce.

If the patient has pulmonary tuberculosis, or tuberculosis elsewhere, and abdominal symptoms ensue, the true diagnosis is often made. However, where no demonstrable tuberculosis is present the diagnosis is often not made. Those patients who have symptoms of acute appendicitis or of strangulation of a hernia which requires early surgery are more fortunate because of early diagnosis. Too often exhaustive studies are made to rule out other conditions. Even if shifting fluid is found in the abdomen, it may be difficult to demonstrate the acid fast bacilli by culture and guinea pig inoculation. In the event that either would become positive, there would be the additional wait of several weeks before the diagnosis is definitely established, during which time the disease would continue to progress. From 1947 to 1950, inclusive, two case records were studied in the weekly clinico-pathological exercises at the Massachusetts General Hospital[8,9] in which the patient had abdominal tuberculosis. In both cases, the discussor had reason to mention tuberculosis of an abdominal organ as the possible diagnosis. One of their cases, as one presented today (SLM, Case 5), had cirrhosis of the liver with ascites. These cases had in common ascitic fluid with a low specific gravity, containing many red and white blood cells

which were predominantly lymphocytes. It was pointed out in their discussion that there had been two cases with the same picture previously presented. The discussor in each case ruled out abdominal tuberculosis because there was no active pulmonary tuberculosis shown by x-ray or clinical findings.

Before the advent of specific therapy, it was believed that just opening the abdomen and allowing air to enter the abdominal cavity was all that was needed and could be done to hasten recovery. It is true that some cases did recover, but it is doubtful whether recovery would not have occurred spontaneously. The discovery of Streptomycin and PAS has been a milestone in the treatment of all forms of tuberculosis. Kallqvist[10] treated 22 cases of intestinal tuberculosis secondary to pulmonary tuberculosis with PAS. He found complete x-ray remission in 10 cases and considerable improvement in seven. After 8 to 16 months from commencement of therapy, thirteen were symptom-free and three had only mild discomfort. Sweany *et al.*[11] treated tuberculous enterocolitis with Streptomycin. There was marked and rapid control of symptoms, although there was only slight improvement on x-ray examination. Several cases relapsed in a few months. Woodbury and Phillips[12] treated a case of acute obstructive tuberculous enterocolitis with nonsurgical ileostomy and Streptomycin with good results. The Veterans Administration Streptomycin Committee advises that combined therapy (Streptomycin and PAS) be used in these cases.

CASE REPORTS

CASE 1. J.A.P., Negro male, aged 24, plumber, was admitted to the hospital on September 6, 1947. He stated he had been ill for four days with pain in the right lower abdomen. There had been no vomiting and his bowels had moved daily. There was no family history of tuberculosis. Physical examination revealed a well developed, well nourished individual, whose height was 69 inches, weight 103 pounds, blood pressure 120/70, temp. 99.4 degrees, P. 94, and R. 20. The abdomen showed tenderness, rebound tenderness and rigidity in the right lower quadrant, more about the umbilicus. Rectal examination revealed slight tenderness on the left side. Urinalysis was negative. Complete blood count gave the following: R.b.c., 4,990,000; Hb., 94%; w.b.c., 15,800; polymorphonuclears, 89%. STS showed a low titered positive Kahn and Wassermann reaction. X-ray of the chest was negative. He was operated on September 6, 1947. Upon opening the peritoneum, there was found an increased amount of muddy fluid which had no odor. The appendix was tense and enlarged. Its entire length and the midportion was densely bound down by adhesions. The wall of the midportion was very thin and friable. The entire appendix was covered by a fibrinous exudate, as was the serosa of the adjacent ileum and cecum. There was no perforation. The usual appendectomy was performed and the stump inverted. His temperature was elevated to 102 degrees on September 7th and 8th. The wound healed by primary intention and he made an uneventful recovery. He received 6,000,000 units of penicillin because of the doubtfully positive serology. Sections of the excised appendix showed numerous tubercles containing epitheloid cells, Langhan's giant cells, and central breakdown. These were present in the mucosa, submucosa, muscularis, and serosa. There was abscess formation in the submucosa. He signed out against medical advice on October 5, 1947. He has not been located to date.

Fig. 1, Case 1.—Photomicrograph of a non-caseous tubercle in the submucosa of the appendix showing epithelioid cells and Langhan's giant cells.

CASE 2. M.B., Negro male, aged 59, laborer, was admitted to the hospital from the domiciliary on February 13, 1948, complaining of swelling of the ankles, shortness of breath, and occasional chest pain. He had had a chancre in 1914 and had re-

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ceived 10 "shots" in the arm "for his blood" in 1920 or 1921. He was admitted to the domiciliary in April, 1938, at which time a systolic murmur was heard at the base of the heart with no radiation. His blood pressure was 126/62. An x-ray of the chest was interpreted as showing cardiac hypertrophy and aortic dilatation. EKG showed left axis deviation. STS showed a 1 plus Kahn and a negative Wassermann. In 1941 he began to complain of substernal pain and in 1943 a disastolic murmur was noticed at the aortic area. In March, 1947, he developed ankle edema and a dry hacking cough. He was admitted to the hospital in April, 1947. Physical examination revealed a poorly nourished individual. There were sclerotic changes in the fundi. There was a pleural rub at the right base. Blood pressure was 120/64, and pulse was 80. The heart was markedly enlarged, and harsh systolic and diastolic aortic murmurs were heard. X-ray of the chest showed slight mottling at the right base. Sedimentation rate was normal, complete blood count was normal, STS was negative, and sputum examinations for acid fast bacilli were negative. Urinalysis showed a trace of albumin. EKG showed a left ventricular strain pattern. He ran an elevated temperature (100.6 to 101.6 degrees) for 3 days. Therapy consisted of penicillin I.M. (2,800,000 units) for an upper respiratory infection, and digitalization. He was discharged in 37 days. He returned to the hospital in one month because of ankle edema, shortness of breath, and abdominal tenderness. Examination revealed rales at the base of both lungs. The liver was enlarged and tender, and there was pitting edema of the legs and feet. X-ray of the chest revealed moderate mottling of the lower two-thirds of the right lung. STS showed a 2-plus Kahn and a negative Wassermann. This was repeated and showed a 3-plus Kahn and a 2-plus Wassermann. Spinal fluid examination was entirely negative. Therapy consisted of 6,000,000 units of penicillin, digitalization, and diuretics. He was discharged to the domiciliary after a hospital stay of 66 days. The final admission occurred on February 13, 1948, because of ankle edema, shortness of breath, and chest pain. Blood pressure was 160/40, and the pulse was 56. Physical examination was otherwise essentially unchanged. X-ray of the chest showed the bronchovesicular markings to be mildly accentuated, and the heart was greatly dilated to the right and left. CBC and sedimentation rate was normal and STS was negative. NPN varied from 35 to 56. Total protein was 5.2 with an A/G of 1.1. Urinalysis revealed albumin and granular casts. His temperature on February 14th, 15th, and 17th was 99.6 to 100 degrees. Elevations between 99 to 100 degrees occurred on April 24th, 25th, and 26th. Therapy consisted of a maintenance dose of digitalis, proteins, salt free diet, fluids, and diuretics. The edema gradually increased and his condition deteriorated. He died on April 26, 1948. Pertinent autopsy findings were as follows: The left parietal pleura was totally adherent to the chest wall and to the diaphragm. The heart was flabby and markedly dilated. There was a laminated thrombus in the left auricle. The aortic valve was slightly thickened and irregular. There was some constriction of the orifice of the right main coronary artery. The ascending aorta showed extensive tree barking and atherosclerosis. On microscopic examination, there was chronic passive congestion of the left lung, liver, spleen, and kidneys. A few small tubercles showing central caseation were seen in the lungs; many more were seen in the substance of the liver and spleen.

CASE 3. L.G., Negro male, aged 22, laborer, was admitted to this hospital on February 25, 1948. On January 6, 1948, he developed pain below the umbilicus. One to two hours later he was admitted to a hospital in Norfolk, Virginia, where an appendectomy was performed. It was stated that peritonitis was present at that time. Additional questioning revealed that the patient had not been feeling well for 2 to 3 weeks prior to this, although he had continued working. He had been having a "heavy feeling" in his stomach and had 2 or 3 bowel movements in the morning and 2 or 3 at night. They were not diarrheal and contained neither blood nor pus. Post-operatively, he developed fecal fistulae. He began to lose weight and strength rapidly. Because of bleeding from one of the fistulae, he was explored. Multiple perforations of the gut with leakage into the peritoneal cavity were found. These perforations were closed. A third operation was performed later in which the jejunum was anastomosed to the colon. There was no history of tuberculosis in the family. On admission to this hospital, he was emaciated, bed-ridden, and chronically ill. Height was 69 inches, weight 110 pounds (be-

fore illness, 162), blood pressure 122/100, temp. 98.8 degrees, P. 84, and R. 20. The abdomen was scaphoid and there was a recent right lower paramedian incision with sutures in place. The lower part of the incision was open widely, and the abdominal wall was absent over a broad area (5 x 3 inches) extending into the right lower quadrant. There was considerable undermining in the right superior border. The bowel emptied on the left side through the jejunal fistula. Just below this another opening was present. This was seen to empty a small amount of feces. In the middle and on the right side there were two other openings which did not contain feces. Palpation of the intestines showed thickening. The abdominal wall was excoriated from the irritating feces. Admission complete blood count revealed the following: R.b.c., 4,510,000; Hb., 14 gms.; w.b.c., 10,600; 78% polymorphonuclears. Urinalysis showed albumin 1-plus, w.b.c., hyaline and granular casts. STS was negative. Culture of pus from the abdominal sinuses revealed B. Coli. X-ray of the chest was negative. He ran an irregular temperature, reaching at times to 100 degrees. On March 4th, an exploratory operation was performed through a supraumbilical transverse incision. The intestines were completely matted together with adhesions and the serosal surfaces were studded with tubercles the size of pinheads, many of which had become confluent. The jejunum was cut and anastomosed to the side of the transverse colon. Biopsy of the peritoneum and a caseous nodule revealed tubercles with central caseation, epitheloid cells, round cells, and Langhan's cells. The acid fast stain was positive. Following operation, he was placed on Streptomycin therapy, which was continued until his death. He showed temporary improvement, but on April 20th, he began to complain of headaches. Spinal fluid examination revealed findings compatible with tuberculous meningitis. In spite of intensification of Streptomycin therapy I.M. along with intraspinal and cisternal magnal Streptomycin therapy, his general condition deteriorated, and he expired on May 15, 1948.

CASE 4. S.H., Negro male, aged 25, student, was admitted to the hospital on April 20, 1949, as a transfer from a hospital in Norfolk, Virginia. He had been shot several times on April 14th, and was operated on shortly thereafter. Multiple penetrating wounds of the jejunum and ileum and one of the descending colon were noted. There was no statement in the transfer note as to the repair of the wounds. In addition, there were gunshot wounds of the left suprapubic region, left upper thigh, right iliac crest, and right buttock. Therapy consisted of suction, blood transfusions, fluids, penicillin, sulfadiazine, and streptomycin. He was received in this hospital in a state of shock; blood pressure was 120/108. The abdomen presented a midline incision, at the lower extremity of which was a sinus opening which drained moderately of seropurulent fluid which did not have the odor of urine or feces. Temp. was 103 degrees, P. 130, and R. 26. Complete blood count showed the following: R.b.c., 2,600,000; Hb., 39%; w.b.c., 16,200. Urinalysis showed 2-plus albumin. The NPN was 32. STS was negative. On April 22nd, the w.b.c. was 35,100 and the polymorphonuclears were 93%. A flat film of the abdomen on admission was negative. He continued to run an elevated temperature between 100 and 102 degrees in spite of blood transfusions, fluids, proteins, vitamins, suction, and penicillin. A flat film of the abdomen on April 27th revealed a pocket of gas below the liver. However, an oblique view failed to reveal this pocket. An x-ray of the chest on the same day showed a mild pleural reaction in the right costophrenic angle and haziness in the right mid-lung field and in the left upper lobe. This was interpreted as showing inflammatory disease. He then began to complain of a severe pain in the plantar surface of the right foot. Numerous blood counts revealed a consistent leucocytosis ranging as high as 49,500. On May 17th a laparotomy was performed. The following were found: A right subdiaphragmatic abscess, a hard indurated inflammatory mass in the hollow of the sacrum, and multiple intra-abdominal abscesses. The abscesses were drained. On June 2nd, he presented symptoms of intestinal obstruction, and a flat film of the abdomen revealed multiple fluid levels. On June 3rd, he was operated on and a prolonged procedure was necessary to release many inflammatory adhesions and evacute contents of many small abscesses between loops of gut. At one point, the wall of the small bowel was adherent to the posterior abdominal wall and separation revealed it to have perforated. The abscess in the right upper quadrant was the largest and had a fecal odor. A few white nodules were noted on the peritoneum. The biopsy report of these were

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foreign body reaction with tuberculosis not entirely ruled out (acid fast bacilli could not be demonstrated). He developed a small intestinal fecal fistula and his condition began to deteriorate. He became comatose on June 27th and died on June 28th. Pertinent findings at autopsy were: The peritoneal cavity was completely obliterated with loops of bowel and abdominal viscera all densely adherent to each other. Some loops of bowel were adherent to the upper abdominal scar. Fistulae and numerous abscesses were present. In many areas small tubercles were present which on section showed caseation necrosis. The right lung in the upper portion of the lower lobe showed a wedge-shaped area of infarction. There was a 2 cm. ragged, thin-walled cavity in the left upper lobe showing caseation necrosis and numerous acid fast bacilli. The lymph node showed caseous tubercles with no organisms.

CASE 5. S.L.M., white male, aged 55, farmer, was admitted to this hospital on July 19, 1949, complaining of fever of five days' duration, ranging as high as 104 degrees. He had a slight non-productive cough of two days' duration. He had had pain under the left costal margin for 20 years. He was first admitted to this hospital in August, 1943, because of fever of 7 weeks' duration associated with generalized weakness, muscular aching, and anorexia. On physical examination his chest was barrel-shaped and hyperresonant. His liver and spleen were enlarged. Complete blood count, urinalysis, and STS and agglutinations for Brucella, typhoid, and paratyphoid were all within normal limits. X-ray of the chest revealed slight pulmonary emphysema. His temperature spiked daily for four weeks. He was discharged after 40 days with a diagnosis of chronic brucellosis. He returned to the hospital in January, 1945, complaining of fever, chills, and aching in the neck, ankles, knees and hips. He had gained 31 pounds since 1943. The spleen and liver were not palpable. Laboratory studies revealed a normal r.b.c. with 9.0 gms. of hemoglobin; urinalysis was normal; Widal and agglutinations for Brucella were negative. Five sputum examinations were negative for acid fast bacilli, and x-ray of the chest was reported as normal. He was afebrile during his 16-day stay in the hospital. He returned to the hospital in February, 1947, because of an acute upper respiratory infection of 3 weeks' duration with persisting hoarseness and dry cough. Blood streaked sputum was present on one occasion. Physical examination was essentially negative. Laboratory studies revealed a normal blood count. Urinalysis revealed a trace of albumin, a few w.b.c., and 20-25 r.b.c. Urine sediment showed no acid fast bacteria on smear and culture. Sputa were likewise negative. X-ray of the chest was negative. He ran a low grade temperature for 3 days and his hoarseness diminished. He was discharged after a hospital stay of 23 days with a diagnosis of tracheitis and laryngitis. Physical examination on the final admission (July 19, 1949) showed a well nourished individual, with rapid respirations, flushed face, and weight 175 pounds (a further gain of 3 lbs. since 1947). A pericardial friction rub was present at the apex. The abdomen was considerably distended by gas. Blood pressure was 126/76, and temp. was 103 degrees, P. 120, and R. 26. Admission blood count showed the following: R.b.c., 3,720,000; Hb, 11 gms.; w.b.c., 20,000 with 90% polymorphonuclears. Several repeat blood counts revealed a normal w.b.c. and a normal differential. His NPN was 60, the TP was 5.7 with an A/G ratio of 0.9. The NPN had risen to 75 on September 23, 1949. Urinalysis revealed albumin with hyaline and granular casts. Brucella agglutinations were negative, as was the Congo red test. There was 80% BSP retention in 45 minutes on a 5 mgm./Kilo dose and the cephalin flocculation was 4-plus. X-ray of the chest on July 19th showed a mild pleural reaction in both costophrenic angles with the possibility of a small amount of fluid on the right. A repeat x-ray on August 29th was reported as showing the lung fields to be clear. G.I. series, I.V.P. and K.U.B. were normal. He ran a spiking temperature for two weeks, varying from 99.4 degrees to 102 degrees. From the third to the ninth weeks he showed an occasional low grade temperature. During this time, the pericardial friction rub disappeared, the abdominal distention lessened, and he became ambulatory. On August 1st, spider nevi were noticed and a moderate sized supraclavicular lymph node was found. The latter was biopsied and section was reported as showing residuals of chronic lymphadenitis, containing pigment which did not take the iron stain. During the ninth week, his abdomen became markedly distended with definite signs of free peritoneal fluid and prominence of the abdominal veins. Paracentesis on September 22nd yielded 12,000 cc. of cloudy

orange red fluid with a specific gravity of 1.012 containing many r.b.c. and few w.b.c., lymphocytes predominating. The bile test was negative and no tumor cells were seen on smear. Unfortunately, no smear or culture for acid fast bacteria was made. His condition gradually deteriorated, with apathy, confusion, and coma. There was no icterus. He died on September 26, 1949. The findings on autopsy were ascites, the visceral and parietal peritoneum covering all organs; the mesentery, the intestines and omentum were studded with innumerable greyish white, translucent glistening nodules from 0.1 to 0.2 cms. in diameter. There were esophageal varices. The liver was shrunken, nodular, and hard. The spleen was enlarged. On microscopic examination, the lungs showed a moderate amount of bronchopneumonia. The nodules of the peritoneum were found to be tubercles with slight central necrosis. The liver showed diffuse infiltration by dense fibrous bands with bile duct proliferation and round cell infiltration.

CASE 6. W.M.F., white male, aged 58, farmer, was admitted to the hospital on November 23, 1949, with a chief complaint of abdominal pain. About four weeks before admission to the hospital, he developed a dull ache around the umbilicus which was constant and prevented sleep. This had gradually gotten worse and radiated to the lower part of the back. He had been nauseated but had not vomited. His appetite had diminished because food, especially fried and fatty foods, appeared to make the pain worse. He felt bloated. He had lost 10 to 12 pounds in this period of time. There had been no change in his bowel habits. He had to quit work because of pain. One brother had died at the age of 37 from tuberculosis. Physical examination revealed an individual who appeared older than his stated age and who was in some distress. He was fairly well nourished and developed. Height was 70 inches, weight 160 pounds, blood pressure 120/80, and temp. was 98.8 degrees, P. 104, and R. 22. The abdomen was somewhat distended and a right herniorrhaphy scar was present. A small umbilical hernia was present and there was generalized diffuse tenderness about the umbilicus. There was no spasm or rigidity and digital recal examination was negative. X-ray of the chest showed calcified hilar glands. G.I. series, G.B. series, and barium enema were all negative. Three stools were negative for blood, ova and parasites. Gastric analysis revealed a hyperacidity. STS was negative. Liver function studies and urinalysis were negative. Sputa were negative for acid fast bacilli. Complete blood count showed a w.b.c. of 7,900 with 69% polymorphonuclears, Hb. 11.8 gms., hematocrit of 40, and a sedimentation rate of 17. He continued to complain of pain in spite of antacids and antispasmodics. He showed temperature elevations as follows: November 23rd, 100.2 degrees; November 24th, 100 degrees; November 25th, 99.6 degrees; November 28th, 99.6 degrees. No cause for the temperature elevations was ascertained. On January 5, 1950, a repair of the umbilical hernia was performed. In mobilizing the neck of the hernial sac, the peritoneum was opened. A gush of clear serous fluid was immediately apparent. The abdomen was then opened and the peritoneum was found to be studded with small multiple tubercles from 1 to 3 mm. in size. Loops of small gut were slightly thickened, hyperemic and studded with similar tubercles. The mesentery was likewise affected. The abdomen was closed. Microscopic examination of a piece of omentum showed indolent, confluent tubercles manifesting fibrosis, epitheloid cells, Langhan's giant cells and a few round cells. Guinea pig inoculation with this material failed to reveal acid fast organisms. He was placed on paraminosalicylic acid therapy. His postoperative course was uneventful. There was a temperature elevation to 100 degrees on January 6th, and the wound healed by primary intention. His weight on January 17th was 138½ pounds. He was discharged to the care of his private physician on January 20, 1950. To date, we have been unable to locate the patient.

CASE 7. Negro male, aged 47, laborer, was admitted to the hospital on February 6, 1950. He complained of pain in the left upper quadrant and vomiting. He was unable to state just when he became ill, but he thought he had lost 50 pounds in weight in the six months prior to admission. The pain was "pretty bad" but was not related to meals nor was there any radiation. There had not been any blood in the vomitus or stool. He had had a head injury in early childhood. He was told by a doctor in 1931 that he had a spot on the lung. He was hospitalized here in 1934 for "syphlitic rheumatism". There was no family history of tuberculosis. Physical examination revealed a poorly nourished indi-

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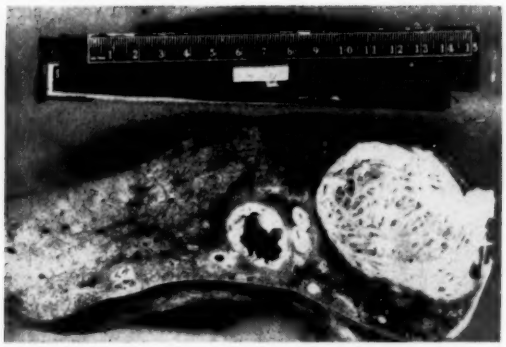

Fig. 2, Case 7.—Picture of a gross specimen of liver showing two large cavities in the right lobe, the largest measuring 7 cms. in diameter, and the smaller 3 cms. The necrotic caseous material has been removed, revealing the white wall of the cavity traversed by fibrous trabeculae. Several smaller, similar cavities are also seen.

vidual who was of low mentality and whose memory was poor. There was evidence of weight loss, he was feeble and he appeared chronically ill. Height was 64 inches, weight 108 pounds, blood pressure

Fig. 3, Case 7.—Photomicrograph of the liver at the edge of the tuberculous capsule showing a few isolated liver cells with fibrosis and round cell infiltration.

120/70, and temp. 98.2 degrees, P. 70, and R. 16. The left pupil was large and fixed (probably secondary to trauma), there was a harsh systolic mitral murmur, and the Romberg was positive. The abdomen showed definite fullness in the right upper quadrant extending towards the midline. The mass on the right was rounded and firm but not hard. To the left of the midline there were several hard and tender nodules which were also connected to the mass. Rectal examination was essentially negative. On admission, complete blood count showed the following: W.b.c., 9,500; polymorphonuclears, 69%; Hb., 6.7 gms.; and hematocrit, 26. Urinalysis was negative. STS showed a 2-plus Kahn. Gastric analysis showed no free HCl after histamine. Spinal fluid examination revealed normal findings. Liver function studies showed 30% BSP retention in 45 minutes after 5 mgm./Kilo dose, 1-plus cephalin flocculation, and an icteric index of 8.6. Sputa were negative for acid fast bacilli. X-ray of the chest and barium enema were negative. X-ray of the spine showed slight anterior wedging of D-7 (probably the result of an old compression fracture). G.I. series revealed marked tenderness over the hepatic area. The stomach was displaced laterally and anteriorly by an extrinsic mass. He ran an irregular elevated temperature continuously. He received transfusions, supportive therapy, and crysticillin. On March 27th, an exploratory laparotomy was performed. A mass the size of a large orange was palpated in the region of the body of the pancreas. The liver was enlarged and there were six areas upon it which had the appearance of metastatic nodules. One of these was biopsied. The biopsy was reported as a tuberculoma of the liver and contained acid fast bacilli. He was placed on streptomycin and paraminosalicylic acid therapy, blood transfusions, and supportive therapy. He showed improvement in his general condition until April 5th, when he developed a bronchopneumonia which did not resolve. He died on April 26, 1950. An autopsy was performed. Significant findings were extensive bronchopneumonia; the hilar and mediastinal lymph nodes were normal. The heart was normal. The liver weighed 1830 gms. and was studded with numerous elevated green-white nodules from 1-5 cms. in diameter which were more numerous in the right lobe. On section, they had a yellow-green necrotic wall and were filled with thick, creamy yellow-green pus having no odor. The lymph nodes at the hilus of the liver and about the head of the pancreas were similarly involved. The spleen was enlarged (hyperplasia). Microscopic examination of the liver and lymph nodes previously described showed caseating tubercles containing acid fast bacilli. The pancreas showed interstitial round cell infiltration and fibrosis.

COMMENT

Seven cases were presented, all of which showed some form of abdominal tuberculosis without evident clinical pulmonary tuberculosis. Five died; the two living cases could not be located so there has been no follow-up. Five were Negroes. Syphilis was apparent or suspected in three cases. Five cases were operated on and four were autopsied. The diagnosis was not suspected even after the abdomen was opened. This applies to the first operation where the patient had more than one operation. Biopsy and microscopic examination revealed the true nature of the disease. There were no specific symptoms or signs. Systemic symptoms were mild or severe. Fever was absent, low grade, or spiking. It did occur as a complication of some other disease process especially in the older age group. Since this hospital does not admit females or children, the true incidence of the disease could not be ascertained. Specific antibiotic therapy was either not given, given in insufficient quantity, or given when the disease process was too far advanced.

The key to making an early diagnosis of tuberculosis of the abdomen is early and thorough surgical exploration in those cases with indefinite but suggestive symptoms. Localized areas of tuberculosis and other correctible surgical lesions can be cared for surgically. Any tissue removed should be sectioned and examined microscopically. It should be remembered that the removal of appendix involved with tuberculosis or the repair of a hernia where the sac is studded with tuberculous nodules or the biopsy of an organ and establishing a diagnosis does not fulfill the surgeon's obligation to the patient. The patient should be referred to an internist whose special interest is in tuberculosis for further antibiotic therapy. Tuberculosis being a chronic systemic disease will require a long period of therapy and adequate follow-up.

SUMMARY

1. Seven cases of abdominal tuberculosis without evident clinical pulmonary tuberculosis were presented.
2. The diagnosis was not apparent even after operation in all these cases. The true nature of the disease process was only determined on microscopic examination.
3. There were no specific symptoms or signs.
4. Early exploratory laparotomy with biopsy should be performed in all cases having indefinite but suggestive abdominal symptoms. Early diagnosis with adequate therapy would be life-saving in a greater percentage of cases.

BIBLIOGRAPHY

1. Goldberg, B., Clinical Tuberculosis. F. A. Davis Co.; 1946.
2. Bockus, H. L.: Gastro-Enterology. W. B. Saunders Co.; 1946.
3. Lichtman, S. S.: Diseases of the Liver, Gallbladder and Bile Ducts. Lea & Febiger; 1942.
4. Guralnick, L., and Glaser, S.: Public Health Reports **65**:468-493; April 7, 1950.
5. Edwards, H. R., and Drolet, G. J.: The Implications of Changing Morbidity and Mortality Rates from Tuberculosis. Am. Rev. Tbc. **61**: No. 1, pp. 39-50; January, 1950.
6. Mayo, C. H.: Tuberculosis of Peritoneum. Ann. Surg. **90**: pp. 614-617; October, 1929.
7. Auerbach, O.: Pleural, Peritoneal and Pericardial Tuberculosis. Am. Rev. Tbc. **61**: No. 6, pp. 845-861; June, 1950.
8. New England J. Med. **237**: No. 17, pp. 643-645; October 23, 1947.
9. New England J. Med. **242**: No. 22, pp. 873-876; June 1, 1950.
10. Kallqvist, I.: Para-Aminosalicylic Acid Therapy in Intestinal Tuberculosis. Am. Rev. Tbc. **61**: No. 5, pp. 621-642; May, 1950.
11. Sweany, H. C., Lichtenstein, M. R., Turner, G. C., and Berard, L.: Streptomycin Treatment of Tuberculous Enterocolitis. Am. Rev. Tbc. **60**: No. 5, pp. 576-588; November, 1949.
12. Woodbury, J. W., and Phillips, S.: Treatment of Acute Obstructive Tuberculous Enterocolitis by "Nonsurgical Ileostomy" and Streptomycin. Am. Rev. Tbc. **60**: No. 5, pp. 648-653; November, 1949.

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HEMORRHAGE DUE TO DICUMEROL AND ITS ANALOGUES*

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Because of the 2% incidence of hemorrhage associated with dicumerol administration[1], certain factors increasing the hazard of hemorrhage and specific therapy for this complication will be taken up. An illustrative case will be presented. The present status of Tromexan will be summarized.

If the incidence of hemorrhage is to be decreased, the contra-indications to the use of dicoumarin should always be kept in mind. They are fairly clear cut, though not absolute, namely: hemorrhagic diathesis; open wounds or ulcerations, particularly of the gastro-intestinal tract; any indication of central nervous system bleeding though small in amount; subacute bacterial endocarditis particularly with a septic infarct involving the central nervous system; hepatic damage; renal disease; severe hypertension where the hazards of intracranial hemorrhage must be considered, and in any person on whom there are not adequate facilities for the determination of the prothrombin time.

Dicumerol is readily absorbed from the gastro-intestinal tract, but its maximum effect is not obtained for two to three days. This anticoagulant suppresses prothrombin production, and Lee has shown that it is concentrated in the liver.[2] Individuals vary with respect to their tolerance to dicumerol, and a small percentage may be resistant to large doses, so that adequate prolongation of the prothrombin time is difficult to obtain. On the other hand, daily administration has a cumulative action, and the anticoagulant activity may persist for ten to fourteen days after the last dose.[3]

After an initial dose of about 300 mgm. of dicumerol, subsequent administration depends on the patient's prothrombin time. The commonest method of prothrombin time determination is the one stage method of Quick[4] or some minor variation thereof. This test, though a good one, has definite limitations. At times, a patient may have a spontaneous hemorrhage though a recent prothrombin time has been reported which would seem to have been relatively within the range of safety. For details concerning prothrombin time determinations and its limitations, one is referred to the recent papers by Riggs[5] and Jaques.[3] As an example of the difficulties which may be encountered during dicoumarin therapy, a case report is submitted in the following paragraph.

A 64 year old, married, white man was hospitalized on the 15th of August, 1950, with precordial pain due to a myocardial infarction. For about two years, he had had proven diabetes mellitus which had been controlled by a diet and 10 units of protamine zinc insulin given daily. Latent and inactive lues, which had been treated and did not involve the central nervous or vascular system, had been previously and completely investigated. His course, with respect to his coronary occlusion and diabetes, was uneventful. However, complications with respect to dicumerol therapy are shown in Figure I. Gross hema-

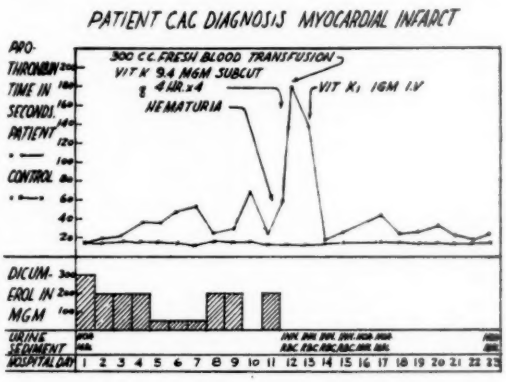
PATIENT CAC DIAGNOSIS MYOCARDIAL INFARCT
PRO-THROMBIN TIME IN SECONDS
PATIENT
CONTROL
300 C.C. FRESH BLOOD TRANSFUSION
VIT K 9.4 MGM SUBCUT
4 HR. x 4
HEMATURIA
VIT K1 10GM I.V.
DICUMEROL IN MGM
URINE SEDIMENT
HOSPITAL DAY
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Fig. 1.

turia was noted on the eleventh hospital day during the evening and lasted for four days. The only other evidence of hemorrhagic diathesis was quite marked ecchymosis of the anticubital fossae associated with repeated venipunctures. As shown on the chart, his prothrombin time rose from 24 to 180 seconds in a period of twenty four hours. On the 12th hospital day, Vitamin K, 9.4 mgms., was begun by hypo. every four hours for four doses, and a transfusion of 300 c.c. of fresh blood was administered during the same afternoon. During the next 20 hours, his prothrombin time fell from 180 to 138

*Read at the annual meeting of the Medical Society of Virginia at Virginia Beach, October 7-11, 1951.

seconds. Because of a delayed chill and febrile reaction associated with the transfusion, the remainder of the blood could not be given on the subsequent day. Hence, on the 13th day, 1 gm. of Vitamin K 1, mixed with 30 c.c. of alcohol and added to 200 c.c. of 5% glucose, was administered intravenously as rapidly as possible in a dimly lighted room. Vitamin K 1, after it has been removed from the vial is extremely light sensitive. As shown in Figure I, the prothrombin time fell in 24 hours from 138 to 18 seconds; it remained elevated for the next nine days varying between 42 and 20 seconds. This was due to the latent effect of dicumerol which, in this case, was present twelve days after the last dose of this particular medication.

This man's hematocrit remained stationary between 42 and 43%. His blood urea was normal on the fourth day after his transfusion reaction, and his urinary output was good throughout his period of hospitalization. He was never icteric, nor was the liver enlarged or tender. Hence, renal and hepatic insufficiency did not seem to be contributory to the sudden rise and prolongation of his prothrombin time. Several other factors have been reported to make for variations in the effect of dicumerol[6,3], namely: (1) drugs, which include salicylates, methyl xanthines, digitalis, and chloroform anesthesia, (2) nutritional status, particularly fasting, protein intake, alcohol consumption, and vitamin C and K levels not only in the diet but also in the body reserves, (3) pregnancy and lactation.

There has been considerable discussion in the literature as to the relative merits of vitamin K and vitamin K 1 in counteracting over-dosage due to dicoumarin[6,7,8,9,10,11,12]. Miller *et al.*[12] failed to note any appreciable effect of the water soluble vitamin K preparations in correcting hypoprothrombinemia due to dicumerol. Both animals and patients were studied. All were carefully maintained throughout the experiments on a given dose of dicoumarin. On the other hand, these observers found that the antagonistic action of vitamin K 1 under comparable conditions was quite striking within a period of eight to twenty-four hours. In a recent study of patients whose prothombin time was over fifty seconds, Overman and Wright[10] divided their subjects into two groups: (a) those who received only water soluble vitamin K preparation, and (b) those not treated. In sixteen patients receiving 72 to 75 mgm. of vitamin K intravenously, there was within a 24 hour period an average decrease in prothrombin time of 45 seconds. For the eight receiving 144 mgm. or more of vitamin K intravenously, there was an average drop of 76 seconds during the same interval of time; whereas the control group had an average diminution of 15 seconds. Previously other observers had reported favorably on the effect of the water soluble preparations in counteracting hypoprothrombinemia due to dicourmarin.[6,7,8,9]

In order to evaluate these two rather divergent opinions, several factors deserve consideration: (1) Simultaneous administration of dicumerol and vitamin K, as reported by Miller,[12] alters the response to vitamin K.[10] (2) Because of the cumulative action of dicumerol, the amount of this anticoagulant administered during the seven to fourteen days prior to using the water soluble antagonist is extremely significant. (3) Vitamin K preparations contain about 40% of the active, antagonistic ingredient, 2-methyl-1, 4 naphthahydroquinone, whereas vitamin K 1, and K 1 oxide contain almost 100%.[10] Hence, a weigh for weigh comparison is not only misleading but also fallacious.

In cases of hypoprothrombinemia due to dicumerol, but not complicated by hemorrhage, the only treatment requisite is the omission of the anticoagulant, and, if situation warrants it, vitamin K 72 to 150 mgm. intravenously every twenty-four hours until the prothrombin concentration returns to safe levels. When slight bleeding is also present, it may be necessary, in addition to the aforementioned therapy, to use blood, plasma, or serum, all of which should be fresh. Lyophilized plasma may be employed since it retains most of its prothrombin potency, but blood and plasma stored in a liquid state quite rapidly decline in this respect. Hypoprothrombinemia associated with hemorrhage of any appreciable degree may necessitate the use of vitamin K 1 or K 1 oxide as well as fresh blood, etc. However, in the presence of active thromboembolic disease, the desirability of rapidly reducing the prothrombin time to normal by administration of the fat soluble vitamin K preparations must be weighed against the threat of hemorrhage to the patient's life.

Because of the latent period with respect to the anticoagulant activity of dicumerol and its prolonged action, two dicoumarin analogues have been under investigation. In Australia, the ethylidene deriative

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of dicumerol has been tried.[3] Though it is less active than dicumerol, recovery from its anticoagulant effects is more rapid. Tromexan, 3, 3′ carboxymethylenebis (4 hydroxycoumarin ethyl ester), is chemically quite similar to dicumerol. (See Figure 2).

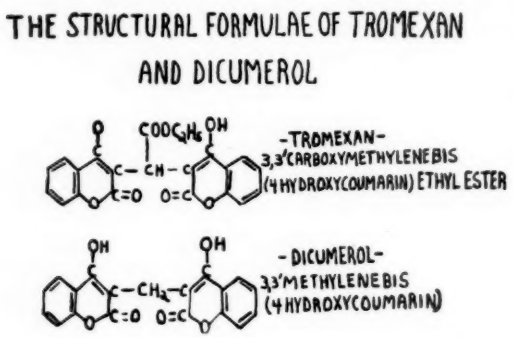

Fig. 2.

In studies on rats, Hausner[17] employed Tromexan and dicoumarin labeled with radioactive C14. Following oral administration, there was no appreciable difference in the rate or the amount absorbed, about 72% of each being recovered from the feces and the gastrointestinal tract. In the case of those animals receiving Tromexan, there seemed to be a higher concentration in the liver and earlier urinary excretion.

In normal individuals, several observers[13,15,17] have found that 1.2 to 1.8 gms. of Tromexan given orally in a single dose lowered the prothrombin time to satisfactory levels within a period of twenty to thirty-six hours. Within sixty hours time, the average prothrombin time had returned to almost 100% of normal.

In England, Burt and her associates[13] used Tromexan in 126 subjects with thrombo-embolic disease. The initial dose was 0.9 to 1.2 gms. Thereafter, as in dicumerol administration, the dosage was regulated according to the prothrombin time. The average, daily maintenance dose was 0.3 and 0.6 of a gm. In 80% of the patients the full effect of the anticoagulant was obtained within 36 hours. A slow initial response did not necessarily mean that these same subjects will show a delay in metabolizing or neutralizing this medication. Within 36 hours after discontinuing this anticoagulant, more than 80% of the patients had a prothrombin concentration greater than 50% of normal. Fifteen subjects required 60 hours or longer for their prothrombin levels to become 50% or more. In the post-partum cases in which Tromexan was used, there was no bleeding, and the infants, which were breast fed, did not have a prolongation of the prothrombin time which can occur with dicumerol administration.[16] Some patients complained of a bitter taste. Mild nausea and vomiting was noted by three of the 126 subjects. One case of hematuria occurred, but this resulted from an over-dosage through an error. In 112 cases treated by Burke and Wright[14,15] their results were in general comparable to those obtained by the British workers. Three patients with renal damage showed evidence of microscopic hematuria, and in one other subject with liver disease, there was slight alteration of the cephalin flocculation test and of the albumin-globulin ratio. Otherwise, no significant toxic effects were noted. Satisfactory hypoprothrombinemiá was usually obtained with a single daily dose of 600 to 2400 mgm. of Tromexan, the amount being determined by the individual's daily prothrombin time. In an occasional case, it was necessary to administer the predetermined amount of this anticoagulant in two or three equal doses during the twenty-four hour period. The relatively rapid action and only slight tendency for any cumulative effect facilitated the regulation of patients receiving Tromexan.

CONCLUSION

Because of the constant threat of hemorrhage associated with the administration of dicumerol and its analogues, an intimate knowledge not only of their specific actions and limitations, but also of their antagonists is absolutely requisite. Tromexan, because of its relatively rapid action and short duration of anticoagulant activity, merits a more widespread clinical trial.

BIBLIOGRAPHY

1. Editorial, J.A.M.A. **144**:466-467, 1950.
2. Lee, C. C., Trevoy, L. W., Spinks, J. W. T., and Jaques, L. B.: Dicumerol Labeled with C^{14}. Proc. Soc. Exp. Biol. and Med. **74**:151-155, 1950.
3. Jaques, L. B.: A Fundamental Consideration of Anticoagulant Therapy. New Eng. J. of Med. **243**:390-401, 1950.
4. Quick, A. J.: On Quantitative Estimation of Prothrombin. Am. J. Clin. Path. **15**:560-566, 1945.
5. Riggs, D. S.: Anticoagulants. New Eng. J. of Med. **242**:216-223, 1950.
6. Foley, W. T., and Wright, I. S.: Long Term Anticoagulant Therapy for Cardiovascular Disease. Am. J. Med. Science. **217**:137-142, 1949.

XUM

7. Barker, N. W., Cromer, H. E., Jr., Hurn, M. J., and Waugh, J. M.: Use of Dicumerol in Prevention of Post-Operative Thrombosis and Embolism with Special Reference to Dosage and Administration. Surgery **17**:207-217, 1945.
8. Cromer, H. E., Jr., and Baker, N. W.: The Effect of Large Doses of Menadione Bisulfite (Synthetic Vitamin K) on Excessive Hypoprothrombinemia Induced by Dicumerol in Man. Proc. Staff. Mayo Clinic. **19**:217-223, 1944.
9. Shapero, S., Weiner, M. and Simson, G.: The Effect of Water Soluble Vitamin K Preparation on Dicumerol Induced Hypoprothrombinemia. New Eng. J. Med. **243**:775-779, 1950.
10. Overman, R. S., Sorenson, C. W. and Wright, I. S.: Effectiveness of Synthetic Water Soluble Vitamin K Preparations in Bihydroxycoumarin Induced Hypoprothrombinemia. J. A. M. A., **145**:393-399, 1951.
11. James, D. F., Bennett, I. L., Jr., Scheinberg, P., and Butler, J. J.: Clinical Studies On Dicumerol Hypoprothrombinemia and Vitamin K Preparations. 1. Superiority of Vitamin K 1 Oxide Over Mandione Sodium Bisulfate U.S.P. and Synkavite In Reversing Dicumerol Hypoprothrombinemia. Arch. Int. Med. **83**:632-652, 1949.
12. Miller, R., Harvey, W. P. and Finch, C. A.: Antagonism of Dicumerol by Vitamin K Preparations. New Eng. J. Med. **242**:211-215, 1950.
13. Burt, C. C., Wright, H. P., and Kubek, M.: Clinical Tests of a New Coumarin Substance. Brit. Med. J. **2**:1250-54, 1949.
14. Burke, G. E., and Wright, I. S.: A New Coumarin Anticoagulant (Tromexan) 4,4' dihydroxydicoumarinal Ethyl Acetate Preliminary Report of Its Action. Bull. N. Y. Acad. Med. **126**:264, 1950.
15. Burke, G. E., and Wright, I. S.: Tromexan-3,3-Carboxymethylenebis (4--hydroxycoumarin) Ethyl Ester Experimental and Clinical Properties. Circulation **3**:164-170, 1951.
16. Barnes, A. C., and Ervin, H. K.: The Effect of Anticoagulants on Post-Partum Bleeding. Surg., Gyn. and Obst. **83**:528-30, 1950.
17. Hausner, E. P., Shaffer, C. L., Carson, M., Johnson, O., Trijille, J., and Langham, W.: Clinical Evaluation of Dicumarinyl Derivatives With A Metabolic Study of Radioactively Labeled Anticoagulants In Animals. Circulation **3**:171-181, 1951.

Many Causes for Common Backache.

"Oh, my achin' back," can be much more than just a slang expression. Most aching backs are the results of an abnormal change in the normal physiological curves of the spine, in the opinion of Dr. Frank R. Ober, a Boston orthopedic surgeon.

Writing in a recent Journal of the American Medical Association, the author stated he believed the causes of back pains fall into six categories—injuries, bad posture, congenital malformations, diseases of spinal bones and joints, malignant disease, and diseases outside the spine.

Included in these categories are injuries due to bruises, sprains, strains, dislocations, compression fractures and ruptured disks; bad standing, sitting, lying and walking postures; arthritis; tuberculosis and osteomyelitis; cancer, tumors and leukemia; ulcers; smallpox, and pregnancy.

In addition to such causes of backaches, real or fancied pains in the back may result from neuroses, chronic emotional disturbances, malingering and compensation problems, according to Dr. Ober.

"There has been and still is a great tendency to ascribe all backaches to one cause—for example, for many years the term 'sacroiliac dislocation' has been held in great vogue; lately, this seems to be going out of fashion, and the diagnosis of 'ruptured disk' is in the ascendancy."

Treatment of a backache depends on the acuteness of the attack and can include one or more of the following, depending upon necessity: sedatives, bed rest, adhesive plaster strapping, heat treatment, back supports, special corset, special mattress, or exercise.

"Finally," Dr. Ober stated, "physical therapy measures designed to remove inhibiting contractures, restore muscular tone and function, and correct posture will result in a large number of cures."

XUM

HERPES ZOSTER OF THE CRANIAL NERVES*

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It may appear commonplace to discuss the manifestations of herpes zoster of the cranial nerves; but, with the exception of herpes zoster ophthalmicus, herpes zoster of other cranial nerves is not often diagnosed, although it occurs more commonly than one would believe. Herpes zoster is a disease which was well recognized by the ancients; however, our understanding of herpetic involvement of the cranial nerves is of more modern origin. Some forty-odd years ago, Ramsey Hunt[1] presented his concept of herpes zoster of the cephalic extremity as we know it to-day. Tschiassny[2] has more recently elaborated upon these concepts. As a result of these studies, the following classification has evolved:

herpes facialis (gasserian ganglion)
herpes oticus (geniculate ganglion)
herpes auditorius (vestibular and cochlear ganglia)
herpes pharyngis (glossopharyngeal ganglia)
herpes laryngis (vagal ganglia)
herpes occipitocollaris (cervical ganglia).

With the interest in virus diseases obviously stimulated by the recent successful investigations in the therapy of these diseases, we deem it timely to review briefly the manifestations of cranial nerve herpes. This necessarily must be from an anatomical as well as a clinical point of view. To be able to recognize herpes of the cranial nerves, one must have a workable anatomical knowledge of the peripheral distribution and numerous communications of the ganglia, plexuses, and nerve trunks.

Clinically we well know the pattern of the herpetic attack. The patient suffers general malaise for a period of several days. A slight elevation of temperature is expected. Pain and paresthesia of the skin and mucous membrane in an area innervated by the affected nerve precedes the typical and diagnostic eruption of the skin and membranes. A characteristic group of vesicles appear on an erythematous base. The distribution is usually unilateral and confined to the sensory distribution of the involved nerve. Bilateral herpes zoster is quite rare. Regional lymphadenopathy may be present. Pain is variable; it may be mild, even absent, to severe. It usually diminishes with the subsidence of the eruption. An annoying hyperesthesia or postherpetic neuralgia may persist for many months in certain individuals. There is often some increase in cells, chiefly lymphocytes, in the cerebrospinal fluid.

It is considered at the present time that the basic lesion of herpes zoster is probably an inflammatory disease located in the dorsal root or cranial sensory nerve, caused by a neurotrophic and epidermotrophic virus (Lever)[3]. These specific pathological changes are now regarded as more diffuse rather than localized, extending to and involving not only the ganglion but also the posterior and anterior horn cells and the meninges. The cutaneous or mucosal vesicle is thought to be a result of the peripheral migration of the virus from the ganglionic focus to a location in the cutaneous and/or mucosal epithelial cells. A virus has been shown to be present in the vesicles.

Laboratory clinicians have had little success in developing a technique in the diagnosis of the disease, perhaps because the virus has not been found to be transferable from man to any suitable laboratory animal. Blank[4] and his collaborators have recently presented a technique for the cytologic diagnosis of vesicular lesions of the skin and mucous membranes caused by the virus of herpes zoster, simplex, and varicella.

In this discussion of the manifestations of herpes zoster of the cranial nerves, only the salient features can be considered. For instance, there are certain controversial points in tracing the pathways of the taste fibers from the tongue, and the sensory distribution of the facial (glossopalatine) nerve. Discussion of those points will not be attempted. Again, various combinations of the disease involving mul-

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tiple cranial ganglia and nerves are quite common and interesting; but time and space preclude any elaboration here.

Manifestations

Herpes Facialis (Gasserian Ganglion).

This is by far the most common of the sensory cranial nerves affected by the herpetic process. The pain and eruption occur in the sensory areas of the branches of the fifth nerve, especially the ophthalmic branch. Any of the structures of the eye may be affected in ophthalmic herpes. The zoster area includes the skin of the face and the mucous membranes of the nose, nasopharynx, and mouth. Occasionally palsies of the ocular muscles may develop. Theoretically, a unilateral paralysis of the muscles of mastication is possible.

Herpes Oticus (Geniculate Ganglion).

Infection here may cause pain and eruption of the skin of the central portion of the auricle and auditory canal, resembling an external otitis. In addition, there may be interference with taste, lacrimation, and often an associated facial paralysis; this is the so-called Ramsey Hunt syndrome. There may even be a concomitant involvement of the vestibular and cochlear ganglia, producing vertigo, deafness, and tinnitus.

Herpes Auditorius (Auditory and Vestibular Ganglia).

Primary herpetic infection of the auditory and vestibular ganglia is rarely diagnosed. When cochlear and vestibular symptoms present themselves in association with herpes oticus or herpes of some other cranial nerve, the nature of the infection is recognized. Some cases of acute episodes of tinnitus, vertigo, and deafness may be explained on the basis of a herpetic inflammation.

Herpes Pharyngis (Glossopharyngeal Ganglia).

This manifestation of herpes zoster has long been recognized by the laryngologist. It is perhaps uncommon in itself, or frequently, as in herpes zoster of the vagus nerve, is not diagnosed as such. The glossopharyngeal ganglia have sensory representation on the auricle (central section) and the mucous membranes of a part of the soft palate, uvula, tonsil areas, adjacent pharyngeal region, and posterior lateral surface of the tongue. The diagnosis is suggested by ear and pharyngeal pain, plus vesicular eruption in the above mentioned areas of skin and mucous membranes.

Herpes Laryngis (Vagal Ganglia).

The anatomical manifestations of the vagus nerve provide the interesting and varied features of the clinical entity, herpes laryngis or herpes zoster of the vagus nerve. There are connecting links between the vagus, glossopharyngeal, spinal accessory, facial, hypoglossal and cervical nerves. One may demonstrate the vesicular eruption involving the skin of the central part of the auricle, the mucous membrane of the base of the tongue, epiglottis, arytenoids, and aryepiglottic folds. In addition, motor paralysis may affect the muscles of the larynx and pharynx, with resulting dysphonia and dysphagia. Tachycardia, bradycardia, gastric retention, and other manifestations of vagus nerve dysfunction may be prominent. With herpes zoster, then, of the vagus nerve, one may expect such complaints as pain in the ear and throat, difficulty in speech and swallowing, gastric and cardiac distress, and nausea and vomiting. There is little doubt that herpes zoster of the vagus nerve occurs more often than recognized and diagnosed.

Herpes Occipitocollaris (Cervical Ganglion).

Herpes of the second and third cervical ganglia is not uncommon, and is readily diagnosed by the appearance of vesicles in the skin areas supplied by these nerves.

Comment

It must be noted that it is common for herpes of the various individual cranial nerves to be manifested in part only, rather than for the entire picture to be represented. For example, one may have in the vagus syndrome only pain and vesicles in the hypopharyngeal region, with no involvement of the ear, motor manifestations, nor other possible complications. Also, it is common to have a combination of involvement of multiple nerves, such as herpes facialis with ocular paralysis or facial paralysis, or geniculate and auditory ganglia involvement, or a vagoglossopharyngeal syndrome. It behooves us, in the event of the development of pain and vesicles in a zoster zone of a sensory nerve, to search carefully for a possible motor involvement of the fibers of the same nerve or of a neighboring nerve.

XUM

PROGNOSIS

An attack of herpes zoster does not confer a permanent immunity. The disease is a self-limited one, lasting from three to six weeks. The motor paralysis, if present, may last longer; and in elderly and debilitated patients, a troublesome, painful, postherpetic neuritis may develop, lasting for months.

TREATMENT

For the alleviation of pain, control of vesicle formation, paresthesia, and prevention of postherpetic neuritis, many therapeutic agents have been given enthusiastic recommendations in the treatment of the various phases of herpes zoster. Unfortunately, most of these methods have proven to be disappointing and unsuccessful.

With the recent advances in the development of antibiotics, it is natural to find numerous reports in the literature, referable to the use of aureomycin and chloramphenicol (chloromycetin) in cases of herpes zoster. The initial enthusiasm is the same as with the older and now discarded remedies. Most of the reports have been limited to the use of these drugs, particularly aureomycin, in groups of only several cases. Some believed that these antibiotics favorably influenced pain, the rate of formation and healing of the vesicles, and the prevention of postherpetic neuralgia. More recently the reports have become noticeably conflicting in their conclusions. There have been case reports in which patients, while on adequate doses of aureomycin and chloramphenicol for other disease, have developed herpes zoster.

After surveying the recent literature on therapy in herpes zoster, it seems to us that two reports warrant some comment. Finland *et al.*[5] (1949) presented the results of the treatment with aureomycin in 24 cases of herpes zoster. They stated that aureomycin appeared to be of benefit in bringing about rapid healing of the lesions, cessation of vesicular formation, and in favorably influencing pain and postherpetic neuralgia, in the event that the drug was administered early. On the other hand, Carter[6] (1951), in a group of 44 cases, some being used as controls and others being treated with aureomycin or chloramphenicol, arrived at a less favorable impression. The results indicated that there was no significant difference between the controlled and treated groups in regard to pain, the appearance of new vesicles, paresthesia, or the development of postherpetic neuralgia.

The majority opinion now seems to be that aureomycin and other antibiotics are of definite value in the treatment and prevention of secondary infection of the vesicles, and in shortening this phase of the disease and preventing cutaneous scarring; also, that antibiotics are definitely beneficial in treating the ophthalmic complications of herpes zoster.

In the final analysis at the present time, there is no specific nor successful therapeutic agent in the treatment of the nerve disease, herpes zoster. Aureomycin or chloramphenicol, in large initial doses (4 gm. daily), should be given in certain selected cases to combat secondary infections and ophthalmic complications. The local treatment should also be directed to combating secondary infections by the use of medicated powders or ointments. Attempt should be made to control pain; first, with the use of such analgesics as the salicylates, with the addition of codein or demarol in the severe cases. Care should be exhibited in the use of opiates, particularly in the persistent, postherpetic, neuralgic cases.

The use of such drugs and methods as injections of protomide, tetraethylammonium chloride, dihydroergotamine, x-ray irradiation, and others have given indifferent results. In concluding the discussion on therapy, it may be added that cortisone and ACTH have been of no value. Terramycin has not been tried apparently to any great extent as yet, but one could not expect any better results from this drug than from the other antibiotics mentioned.

CONCLUSION

Attention is directed to the manifestations of herpes zoster of the cranial nerves. The condition is not uncommon, but is often not recognized. The treatment remain non-specific except for the use of the antibiotics in the prevention of secondary infection of the vesicles and in the ophthalmic complications, thus shortening the duration of the disease, and preventing scarring and impairment of vision.

BIBLIOGRAPHY

1. Hunt, J. R.: On Herpetic Inflammations of the Geniculate Ganglion, A New Syndrome and Its Complications. Jour. Nerv. and Mental Dis. **34**:73, 1907.
———: The Symptom-Complex of Acute Posterior Poliomyelitis of the Geniculate, Auditory, Glossopharyngeal and Pneumogastric Ganglia. Arch. Int. Med. V:631, 1910.
2. Tschiassny, Kurt: The Site of the Facial Nerve Lesion in Cases of Ramsey Hunt's Syndrome. Annals

Otol., Rhin. and Laryng. **55**:152-174 (Mar.) 1946.
———: Herpes Zoster Oticus (Ramsey Hunt's Syndrome). Arch. Otolaryng. **51**:73-82 (Jan.) 1950.
3. Lever, W. F.: Histopathology of the Skin. J. B. Lippincott, Phila., 1949.
4. Blank, H.; Burgoon, C. F.; Baldridge, G. D.; McCarthy, P. L.; and Urbach, F.: Cytologic Smears in Diagnosis of Herpes Zoster and Varicella. J.A.M.A. **146**:1410, (August 11) 1951.
5. Finland, M.; Finnerty, E. F.; Collins, H. S.; Baird, J. W.; Gocke, T. M.; and Kass, E. H.: Aureomycin Treatment of Herpes Zoster. New Eng. J. Med. **241**:1037-1047, (Dec. 29) 1949.
6. Carter, A. B.: Investigation into Effects of Aureomycin and Chloramphenicol in Herpes Zoster. Brit. Med. Jour. **1**:987-991 (May 5) 1951.

Drug Helps to Relieve Polio Pains and Spasms.

Priscoline (trade mark), a drug which inhibits the sympathetic nervous system, has been found effective in relieving pain and spasm in some patients with acute poliomyelitis affecting the spinal nerves, it was stated in the March 29 J.A.M.A. In many cases the drug affords adequate relief of symptoms, making sleep and rest possible, permits more effective physical therapy, and removes the necessity for undesirable hot packs, according to Drs. A. C. LaBoccetta and K. E. Dawson, of the Philadelphia Hospital for Contagious Diseases, Philadelphia.

The doctors based their conclusions on a study of 71 patients with acute polio affecting the spinal nerves. The patients, ranging in age from one to 34 years, were given the drug orally and intramuscularly. Minor side effects occurred in several patients, but disappeared upon withdrawal of the drug.

Forty-five (63.4 per cent) of the patients treated with priscoline showed desirable response, the doctors pointed out. When the response was good, definite relief occurred within 15 to 30 minutes after administration of the drug.

Complete relief of pain and complete or nearly complete relief of muscle spasm was obtained in 19 (26.8 per cent) of the patients. Partial effect, with complete relief of pain without striking relief of muscle spasm, was obtained in 26 (36.6 per cent) of the patients; no effect was seen in 26 (36.6 per cent).

Muscle pain occurs in the majority of, if not all, cases of acute poliomyelitis affecting the spinal nerves, the doctors stated. Pain may occur spontaneously, or may be caused by pressure or stretching of the muscle; shortening muscles believed to be in spasm are usually the most painful. The duration of such pain is usually two to six weeks, although it may last six to nine months.

The mechanism of the pain is not definitely known, and the relationship between muscle pain or spasm and the accompanying or ensuing paralysis has not been established, the doctors added. However, it is generally accepted, they said, that prolonged muscle spasm, particularly when associated with muscle shortening, may be harmful by deterring recovery or causing permanent changes in the affected muscles.

XUM

INEQUALITY OF LEG LENGTH*

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The problem of inequality of length of the lower extremities has been a challenge to orthopaedic surgeons for many years. Prior to the advent of anesthesia and modern surgical technique, the only answer to this problem was the use of a built-up shoe or some type of prosthetic device for the affected leg.

In the past century, the correction of unequal leg lengths has been approached by methods of either lengthening the short leg or shortening the good leg. The first recorded operation of this type was done by Rizzoli[2] of Italy, who in 1845 deliberately allowed a fractured femur to override and shorten by three inches to compensate for a short leg on the opposite side. This approach to the problem, as well as others of similar nature by the same surgeon, were fairly successful considering the crude instruments at his disposal. Very little further work of this nature is reported in the literature for the next fifty years. In 1905 Codivilla[1] approached the problem by lengthening the affected leg. He employed a traction pin through the os calcis to maintain traction on the leg after osteotomy of the femur (Figure 1). Codivilla, among others, pointed out the relative ease of obtaining as much as 4 cms. lengthening of the femur itself, but emphasized the extreme difficulty encountered in obtaining the same amount of length from the blood vessels and nerves. Paralysis and extensive skin sloughs were not uncommon following attempts to lengthen a leg. These major and often tragic complications following leg lengthening operations (Figures 2-A and 3) caused almost complete abandonment of this approach to the problem for many years.

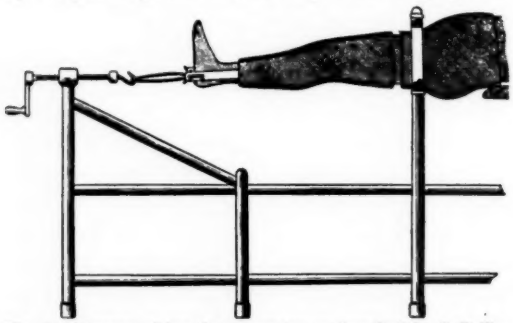

Fig. 1.—Diagram of traction apparatus as described by Codivilla. Traction is applied through a pin in the os calcis following osteotomy of the tibia or femur. (Redrawn from *American Journal of Orthopaedic Surgery*, 2, 1905).

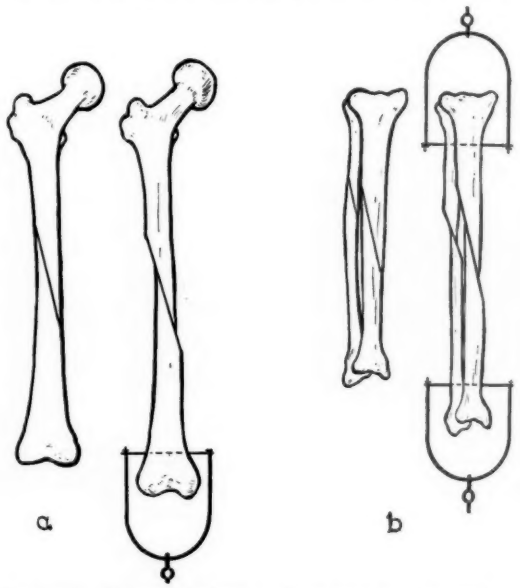

Fig. 2.—A. Oblique osteotomy of femur with traction applied by Kirschner wire through lower femur.
B. Osteotomy of tibia and fibula with traction applied through proximal and distal tibia, as reported by Abbott and Saunders.

The next logical procedure was that of shortening the good leg. Many ingenious methods for leg shortening were outlined by investigators interested in the problem. (Figure 4). Considerable resistance was, and still is, encountered from the patient or his family against any operation on the good leg. Fear of complications or deformity of the good leg following surgery are certainly understandable rea-

*Read before the annual meeting of The Medical Society of Virginia at Virginia Beach, Oct. 7-11, 1951.

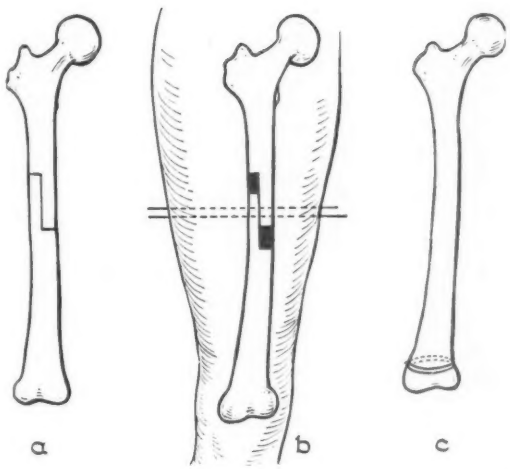

Fig. 3.—A and B. Schematic drawing of step-cut osteotomy of femur internally fixed by two Kirschner wires. The wires are incorporated in the cast and removed when sufficient callous has formed.

C. Schematic drawing of wire loops encircling the distal femoral epiphysis, as reported by Haas.

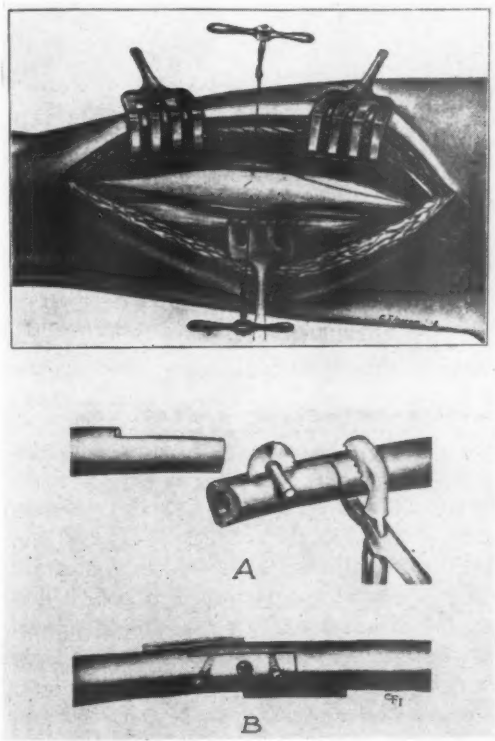

Fig. 4—Step-cut osteotomy of femur followed by mortice fitting of fragments. Internally fixed with screws and utilization of the mortice fragments as onlay bone grafts. (Reprinted from *Campbell's Operative Orthopaedics*).

sons for objections to surgery on the unaffected leg. Calve and Galland[3] described a new and meticulous method of femoral shortening in 1918 (Figure 5). Taylor[4] in 1916 and Shands[5] in 1917 had previously used different operative techniques in seeking an answer to effective shortening of the good leg. Following World War I, very little work was done on either leg lengthening or leg shortening for several years. In the late twenties and early thirties several investigators became interested in leg lengthening again. In 1936 Abbott and Saunders[6,7,10] of San

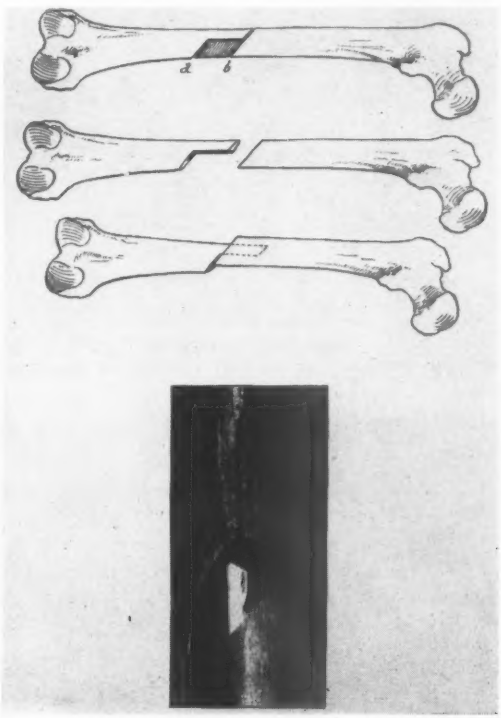

Fig. 5.—Method of Calve and Galland for femoral shortening, using an autogenous intramedullary bone peg. (Reprinted from *American Journal of Orthopaedic Surgery*, 16, 1916).

Francisco described a very extensive operative technique for leg lengthening (Figure 2-B). They repeatedly emphasized the danger of vascular and nerve complications, but in spite of these warnings their investigations stimulated many others to attempt leg lengthening. The many tragic and often fatal complications resulting from many of these operations practically stopped all attempts at leg lengthening. In 1932 Phemister[11] of Chicago had approached the problem by an operation to arrest

the growth of the good leg by curetting the epiphyseal plates of the lower femur and upper tibia (Figure 6). This approach to the correction of inequality

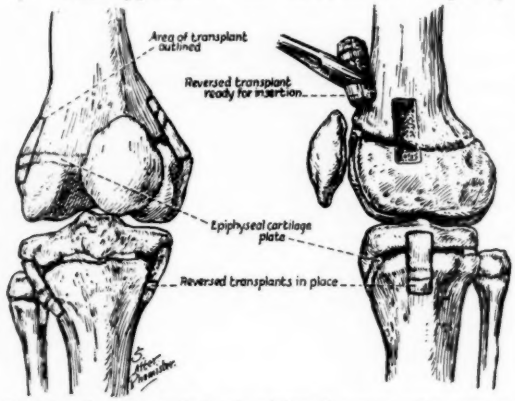
Area of transplant outlined
Reversed transplant ready for insertion
Epiphyseal cartilage plate
Reversed transplants in place

Fig. 6.—Phemister technic of epiphyseal arrest, using reverse bone blocks. The epiphyseal plates are curetted prior to re-insertion of the bone blocks. (Reprinted from *Journal of Bone and Joint Surgery*, 1, 1933).

of leg length was the most scientific and least hazardous of all previous attempts. This operation of epiphyseal arrest was of less magnitude than any previously described procedure and carried relatively little risk of complications. Phemister used as a guide for surgical intervention a chart of expected growth of the good leg.

Investigations by others interested in the problem resulted in several charts of future leg growth estimation[12,20]. No two of these growth charts were in agreement, however, with the result that the operation for epiphyseal arrest resulted in either over-correction or under-correction. The major fault with Phemister's operation was that if epiphyseal growth was not completely stopped on both sides of the epiphyseal plate, angular deformities occurred, such as knock knees or bow legs. In spite of these difficulties, however, tremendous interest was stimulated and within a few years much accurate knowledge was added to the problem of the unequal leg. Sympathectomy of the short leg side was offered as a possible solution on the assumption that the increased blood supply would stimulate epiphyseal growth[18]. So little growth was gained, however, as a result of sympathectomy, that this approach was soon abandoned. X-ray irradiation[19] of the epiphysis of the good leg was very popular both here and in England for a short while, but was soon discarded because of inaccuracies and because of the complications of soft tissue damage from the X-ray. Further attempts[22] to stimulate the growth of the short leg by periosteal stripping, fractures, etc., were all too inaccurate to be of value. Pease[23], of Chicago, however, actually stimulated epiphyseal growth by inserting irritating screws or bolts of metal or ivory in the metaphysis near the epiphyseal plate. His results from this approach, as recently reported, are very stimulating, but further investigative work is needed before this method can be widely used.

In 1945 Haas[16,17], of San Francisco, opened an entirely new field of investigation when he reported the arrest of epiphyseal growth by insertion of a wire loop around the epiphyseal plate (Figure 3-C). *The most remarkable part of this report was the revelation that in those cases in which the loop broke, due to excessive strain, growth of the epiphyseal plate actually continued at the same rate as prior to the insertion of the wire loop.* This very important contribution by Haas stimulated Dr. Walter Blount[14,15] of Milwaukee, to approach the problem of epiphyseal arrest by placing stainless steel staples across the epiphyseal plate (Figure 7). His in-

Fig. 7.—Artists drawing of Blount's type stainless steel staples inserted in distal femoral and proximal tibial epiphyses.

vestigations have placed in the hands of the orthopaedic surgeon a very simple, highly accurate, means of equalization of leg length. His work has been further enhanced by the investigations of Dr. William Green[8,9], of Boston. Green has studied and accurately charted the growth of both normal children and those affected by poliomyelitis. The reports of his studies make it possible to know exactly how much growth can be expected in a child and to plan epiphyseal arrest so that the end result will be extremely accurate in the great majority of cases.

The use of staples to arrest epiphyseal growth can not only be employed for arrest of longitudinal

growth, but can also be used to correct angular deformities, such as knock-knees, bow legs, and so forth.

The following statistical factors are but a few of the results of the investigations of Green, Baldwin, Hatcher, White[13,21] and many others to aid the orthopaedist in planning a contemplated epiphyseal arrest.

TABLE I

70% of the growth of the femur occurs in the distal epiphysis; 56% of the growth of the tibia occurs in the proximal epiphysis.

Of the total growth of the lower extremity, the distal femoral epiphysis contributes 40% and the proximal tibial epiphysis 27%.

TABLE II

In actively growing children past the age of 8 years until cessation of growth the distal femoral epiphysis grows 1.3 centimeters per year and the proximal tibial epiphysis 0.9 centimeters per year—a total of 2.2 centimeters or 7/8" per year.

On the average boys grow until the age of 16¼ years.

On the average girls grow until the age of 14¼ years.

The rate of growth in the last year is only one-half of that during the actively growing years.

With these proven facts available, the orthopaedist can plan the operation of epiphyseal arrest with accuracy and with the knowledge that the end result in the great majority of cases will be within 1/4 to 1/2 inch of the perfectly desired end result.

TABLE III

THEORETICAL CASE

(1) A 9 year old male with 2½ inch (6.25 cms.) shortening of the left leg due to poliomyelitis.

(2) Divide the amount of shortening in centimeters (6.25) by the yearly increment of growth—2.2 centimeters. 6.25 divided by 2.2 equals 2.7.

(3) This factor (2.7) is then subtracted from the age at which growth ceases—for boys 15 years and 9 months (16¼ years minus 6 months due to only ½ rate of growth in past year).

(4) 15.75 minus 2.7 equals 13.05—the age at which the epiphyseal arrest should be done.

There is some disagreement at the present time as to whether the epiphyseal arrest should be done on the basis of the above mentioned formula. Green and others feel that this scientific approach is to be desired. Blount, on the other hand, feels that the epiphyseal arrest should be done as early as possible, and when equalization of the leg lengths has been obtained, then remove the staples and allow growth to proceed. We have not had enough experience with epiphyseal stapling as yet to take sides in this controversy.

The operation of insertion of the staples across the epiphyseal line, either of the femur or tibia or both is a relatively easy procedure and can be done with great accuracy, using portable X-rays at the time of operation to check the insertion of the staples. (Figures 8, 9, 10, 11).

Fig. 8.—X-rays of 13 year old white male with Blount type staples bridging the distal femoral and proximal tibial epiphyses.

Fig. 9.—X-rays of a 10 year old white female with Blount type staples bridging the distal femoral epiphysis only.

At Crippled Children's Hospital and Medical College of Virginia Hospital, Richmond, Virginia, we have done thirty-five epiphyseal arrest operations in the past two and one-half years. It is obvious that the period of follow-up in many of these cases is too short as yet to come to any definite opinions or conclusions, but we are reporting our experiences with these 35 cases in the hope that further work of this nature will be stimulated.

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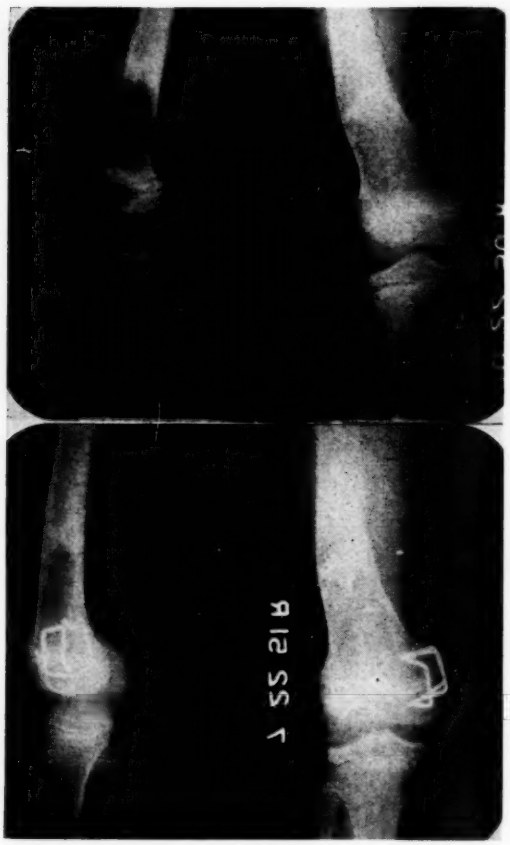

Fig. 10.—Pre-operative and post-operative x-rays of a 10 year old white female with knock knee deformity secondary to old fracture of lower femur with staples bridging distal medial femoral epiphysis.

Fig. 11.—X-rays of 8 year old white male with knock knee deformity associated with Van Recklinghauser's disease and pseudo-arthrosis of tibia (amputation has previously been done because of the pseudo-arthrosis), showing staples bridging distal femoral epiphysis medially.

TABLE IV

Total Number of Cases	35	
Male	24	
Female	11	
Average Age	11.3 Years	Youngest 6 Oldest 15
Boys	11.8 Years	
Girls	11 Years	

TABLE V

Types of Epiphyseal Arrests Used:	
Blount Staples	27
Currettment of Epiphyseal Plate	5
Reverse Bone Block	3
Sites of Epiphyseal Arrest:	
Femur and Tibia	18
Femur, Only	14
Tibia, Only	3

TABLE VI

Cause for Inequality of Leg Length

Poliomyelitis	16
Osteomyelitis	5
Epiphyseal Injuries	5
Congenital Malformation of Leg	4
Tuberculosis of Hip	3
Congenital Dislocation of Hip	1
Arterio-Venous Fistula	1
Total	35

TABLE VII

Results

Full equalization of leg length or optimum result obtained	18
Failure to gain sufficiently as predicted or expected (greatest discrepancy being ¾")	8
Failed to obtain any shortening due to epiphyseal arrest at too late an age	4
Too early to evaluate	5

In those cases of knock knees due to over-growth of the medial femoral condyles, staples can be placed across only the medial surface of the distal femoral epiphysis to correct the angular deformity (Figure 10, 11). Similarly, in cases of bow legs due to over-growth of the lateral femoral or tibial condyles, staples can be used in the lateral surfaces of these epiphyses to arrest growth. When the deformities have been corrected the staples can be removed and growth will resume at a normal rate again. Our most satisfactory results to date have been in the four cases of knock knees for which medial femoral epiphyseal arrest was done. In each of these cases full correction was obtained in less than one year. All four have since had the staples removed and we are watching their future progress with considerable interest to see what the ultimate end result will be.

We have had no serious complications in any of these 35 cases. The first case in which epiphyseal staples were used has been our most unsatisfactory result. In this instance, due to an error in judgment, only two staples were used in each side of the femur, with the result that one staple subsequently broke. Only one inch of growth was arrested in 2 1/2 years in this case, due to the improper use of only two staples. There has been no difficulty in regaining motion of the knee, all cases having gained full motion of the knee on the operated side within two months after operation. There have been no complaints of pain in the operated knee after the initial post-operative recovery period. *Our poor results have been in not operating soon enough.* With the knowledge of epiphyseal stapling we have gained in the past 2 1/2 years, we are hopeful of improving our results in the future.

REFERENCES

1. Codivilla, A.: On The Means of Lengthening, In The Lower Limbs, The Muscles and Tissues Which Are Shortened Through Deformity. Amer. Jour. Orthopaedic Surg. **2**:353, 1905.
2. Rizzoli, F., and Taruffi, Cesare: Accavallamento die Frammenti D'Una Recente Frattura die Femore Destro, Procurato del Prof. Rizzoli, Onde Togliers il Difetto del Zoppicare Rimasto in Seguito di Antica Frattura del Femore Sinistro. Bull. d. sc. med. di Bologna, **9**:39, 1946.
3. Calve, J., and Galland, M.: A New Procedure For Compensatory Shortening of The Unaffected Femur. Amer. Jour. Orthopaedic Surg. **16**:211, 1918.
4. Taylor, R. T.: Shortening Long Legs and Lengthening Short Legs. Amer. Jour. Orthopaedic Surg. **14**:598, 1916.
5. Shands, A. R.: Shortening of The Long Leg. Internat. Jour. Surg. **30**:273, 1917.
6. Abbott, Leroy C.: The Operative Lengthening of The Tibia and Fibula. Jour. Bone & Joint Surg. **9**:128, 1927.
7. Abbott, Leroy C., and Saunders, J. B.: The Operative Lengthening of The Tibia and Fibula. Ann. Surg. **110**:961, 1936.
8. Anderson, Margaret, and Green, William T.: Lengths of the Femur and Tibia. Amer. Jour. Dis. Child. **75**:279, 1948.
9. Green, William T., and Anderson, Margaret: Experiences with Epiphyseal Arrest in Length Of The Lower Extremities in Infantile Paralysis. Jour. Bone & Joint Surg. **29**:659, 1947.
10. Gill, G. G., and Abbott, L. C.: Practical Method of Predicting the Growth of the Femur and Tibia in the Child. Archiv. Surg. **45**:286, 1942.
11. Phemister, D. B.: Operative Arrestment of Longitudinal Growth of Bones in the Treatment of Deformities. Jour. Bone & Joint Surg. **15**:1, 1933.
12. White, J. W., and Warren, W. P.: Experiences With Metaphyseal Growth Arrests. South. Med. Jour. **31**:411, 1938.
13. White, J. W., and Stubbins, S. G.: Growth Arrest For Equalizing Leg Lengths. J. A. M. A. **128**:1146, 1944.
14. Blount, Walter P., and Clarke, George R.: Control of Bone Growth by Epiphyseal Stapling. Jour. Bone & Joint Surg. **31**:A;464, 1949.
15. Blount, Walter P.: Control of Bone Growth. Personal Communication.
16. Haas, S. L.: Retardation of Bone Growth by a Wire Loop. Jour. Bone & Joint Surg. **27**:25, 1945.
17. Haas, S. L.: Mechanical Retardation of Bone Growth. Jour. Bone & Joint Surg. **30**:A;506, 1948.
18. Harris, R. L.: The Effect of Lumbar Sympathectomy on The Growth of Legs Shortened From Anterior Poliomyelitis. Jour. Bone & Joint Surg. **12**:859, 1930.
19. Barr, J. S., Lingley, J. R., and Gall, E. A.: The Effect of Roentgen Irradiation on Epiphyseal Growth. Amer. Jour. Roentgenol. **49**:104, 1943.
20. Stinchfield, Allan J., Reidy, John, and Barr, Jos.: Prediction of Unequal Growth of The Lower Extremities in Anterior Poliomyelitis. Jour. Bone & Joint Surg. **31**-A:478, 1949.
21. Wilson, P. D., and Thompson, T. C.: A Clinical Consideration of The Methods of Equalizing Leg Lengths. Ann. Surg. **110**:992, 1939.
22. Wu, Y. K., and Miltner, L. J: A Procedure of Stimulation of Longitudinal Growth of Bone. Jour. Bone & Joint Surg. **19**:909, 1937.
23. Pease, Charles N: Local Stimulation of Growth of Long Bones. Paper read at American Academy of Orthopaedic Surgeons, Chicago, January, 1951.

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LOWER NEPHRON NEPHROSIS AND THE ARTIFICIAL KIDNEY —A CASE REPORT*

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The attitude of cautious reserve and pointed questioning which physicians have taken toward clinical use of the artificial kidney has been largely resolved during the past two years in favor of limited acceptance. This gradual integration of opinion toward limited acceptance is due, of course, to the growing number of favorable clinical responses achieved by use of this new therapeutic tool. It has been convincingly demonstrated by a number of workers that the artificial kidney can produce profound changes in the composition of the blood and that these changes can be controlled in a way to benefit the patient in a number of ways. Nonprotein nitrogen blood levels can be reduced, acidosis can be corrected without the undesirable necessity of adding sodium ions to a circulation already overloaded with sodium, and dangerous potassium levels can be easily controlled.

Nevertheless, despite the proved fundamental utility of the various modifications of these machines, they are all in an experimental and rather crude and cumbersome phase of development, and, it follows, the advocates and utilizers thereof are admittedly and necessarily experimenters. Were this not true, there would not now exist any such contrivances at all. Furthermore, successful and reasonably safe external hemodialysis, as the application of the artificial kidney has been designated, requires not only mechanically and chemically adequate apparatus, but also alert, thoughtful supervision by well-trained professional people who believe strongly in the merit of the procedure. In a number of clinics these basic requirements are amply satisfied, with results which justify and encourage continued study of the procedure as a therapeutic measure and serious pursuit of the engineering research necessary for advanced improvements in design, efficiency, and operation. The present non-availability of a superior finished product, suitable for general use, is not valid criticism of the principles and aims of external dialysis.

Having accepted the validity of the theoretical principle of the artificial kidney, the clinician wishes to know what specific results can be obtained in actual practice. The reported results are impressive. It has been shown repeatedly[1,2,3,4,5,6,7,8,9,10] that it is possible to depress the circulating nonprotein nitrogenous waste product level and to alter the acid-base ratio of the blood to a degree that readily permits a desperately ill patient to survive a hazardous period of renal suppression. The devastating and relentless progression of uremic poisoning can be halted, and even turned back temporarily toward something approximately life-permitting biochemical balance. When this significant and striking chemical reversal occurs it usually is accompanied by equally fortunate and striking clinical improvement. After a single six-hour period of dialysis the clinical gain may not again deteriorate; rather, it more likely will persist, at lower levels perhaps, until the onset of recovery diuresis[5].

Reduction of circulating wastes and correction of acidosis do not exhaust the useful ends that can be achieved. Foremost among the ancillary effects of dialysis is the prompt reduction of dangerous hyperkalemia from life-threatening heights of elevation. Merrill[5] has recently emphasized the grave danger of hyperkalemia and the pressing necessity for correcting this physiologically intolerable contingency early enough in its expanding genesis to prevent imminent and sudden death from cardiac arrest. He also points out that the deadly seriousness of hyperkalemia cannot be accurately ascertained by laboratory determinations of circulating potassium but that this critical complication can be readily discovered by the electrocardiogram. His abundant experience and the experience of others[5,11,12] seem to prove that a relatively moderate increase in circulating potassium may nevertheless be associated with profound electrocardiographic changes of the gravest import. When potassium intoxication does supervene, Merrill maintains that the patient can be more rapidly and completely extricated from this somber plight by dialysis than by any other method now available. He goes

*No objection to publication on grounds of military security, by authority of t' e office of Public Information, Department of Defense.

on to say that prompt dialysis when the danger appeared has unquestionably prevented a fatal outcome in a number of his patients.

Other salutary, less easily measured effects of dialysis on patients in advanced uremic states are subsidence of nausea and vomiting, return of a feeling of well-being, and relief from headache, somnolence, and confusion. This highly desirable symptomatic improvement makes easier the task of sound, logical medical management, still the master-plan of treatment. Resuscitation of a stuporous, laboriously and irregularly breathing, apparently moribund patient to a state of mental clarity, alertness, and quiet, orderly respiration after a few hours of dialysis is an impressive and remarkable occurrence which, while not uniformly attainable, is the rule with this treatment[5].

For all its actually proved, and even its vast potential worth as a powerful therapeutic tool, the artificial kidney has not simplified or essentially altered in any way the fundamental treatment of acute renal suppression. Rather, this new addition to our total resources makes necessary a still more careful appraisal during the critical period of urinary suppression. The causes of death during this period are, in the probable order of frequency, acute pulmonary edema, acidosis, tetany (hypocalcemia), and acute potassium intoxication. The first three causes of death, acute pulmonary edema, acidosis, and tetany, are quite well controlled by elementary measures and techniques which are available in nearly all hospitals, and which require for correct execution little more than an adequate clinical laboratory and good clinical judgment. However, neither the laboratory nor the keenest clinical insight is capable of detecting incipient, yet extremely dangerous potassium intoxication, although this can easily be revealed by the electrocardiogram[5,11]. Such useful information does not thereby diminish the value of chemical determination of potassium levels, for as a laboratory measuring device the electrocardiogram is worthless, but as an indicator of potassium intoxication it is supreme.

Appended herewith is a case report concerning an Army officer treated at the Peter Bent Brigham Hospital by the artificial kidney, under the supervision of Dr. John P. Merrill of that institution. The writer of this report was merely an interested observer of some of the significant phases of the patient's treatment, and he did not in any way actively participate in the events recorded, except during the patient's follow-up studies at the Murphy Army Hospital.

Case Report

A thirty-three year old male officer was admitted to an Army hospital in Puerto Rico on December 30, 1950, with chief complaints of nausea, vomiting and decreased urinary output of three days' duration. The significant facts in his recent history were that on three separate occasions during the week prior to onset of symptoms, at intervals of two days each, he had sprayed his house liberally with carbon tetrachloride, using a total of two and one-half gallons. During this same period he had also consumed seven or eight cans of beer and several whiskey drinks on three or four occasions. Urinary suppression began slowly, then rapidly became alarming, and at the time of the hospital admission three days later was nearly complete.

The past history was essentially negative. Moreover, there had been no recent contact with sick or jaundiced people, no encounter with rats, and no reception of vaccines, sera, or other injections during the preceding six months.

Physical examination revealed a drowsy, well-developed, well-nourished young male adult, with moderate generalized jaundice, but was otherwise essentially negative. Blood pressure was 110/70.

The patient was treated carefully with intravenous fluids according to calculations based on sensible and insensible fluid loss. He continued to vomit, the quantity of vomitus reaching 1600 c.c. per day, drowsiness became deeper, severe oliguria persisted and his general condition gradually and rapidly deteriorated.

Under these ominous circumstances the clinicians responsible for his treatment decided that the patient should be transferred to a hospital where an "artificial kidney" was available. Accordingly, he arrived by air at the Peter Bent Brigham Hospital in Boston on January 4, 1951, five days after his original admission to the hospital in Puerto Rico, and fifteen days after his first contact with carbon tetrachloride.

At this admission, physical examination again revealed generalized moderate jaundice, profound drowsiness, and blood pressure elevated to 155/95. Analysis of the tiny specimen of urine available showed 3+ protein, many W.B.C., a few R.B.C.,

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and many granular and cellular casts. The hematocrit reading was 30 per cent, white blood cells 6,000, with 56 per cent polynuclear cells, B.U.N. 79, N.P.N. 129, CO_2 6.5, blood sugar 102, blood chloride 19 mEq/L, sodium 134 mEq/L, potassium 5-3 mEq/L, serum bilirubin 0.9 mg. per cent, alkaline phosphatase 2.2, and phosphorus 3.0 mEq/L. Stool benzidine test was 3+.

X-ray examination of chest showed the heart to be enlarged in the transverse diameter, measuring 151 mm. as compared with the predicted diameter of 127 mm. Serial ECG. showed slight peaking of T waves in the precordial leads, but not beyond normal limits.

Inasmuch as the general condition became progressively worse, stupor deepening, and oliguria unrelenting, treatment by external hemodialysis was instituted on the third hospital day. After six hours the symptomatic and laboratory improvement were striking. The patient became much brighter mentally and the B.U.N. dropped from 117 to 45. However, the temperature which was normal on admission, rose to 102° following dialysis, maintained approximately this level for two days, then returned to normal.

Subsequent to dialysis, the B.U.N. gradually increased to 105 mg. on the ninth hospital day, then reversed its course and gradually fell to 28 at time of discharge. Oliguria persisted until the sixth hospital day, at which time this ominous symptom also began to resolve favorably, the urinary output quickly rising to two liters on the ninth day.

After hemodialysis the patient was placed on a twenty-gram protein and low potassium diet until diuresis set in. Fluids were replaced on a calculated basis, and the patient's weight remained remarkably constant at about 68 kg. until the urinary output passed above oliguric levels, when the weight fell to 65 kg.

Other significant items in his treatment were 1,000 cc. of whole blood, penicillin, vitamins, testosterone propionate for the first week, and digitalis for the first four days.

Two days before discharge BSP showed 10 per cent retention at the end of thirty minutes, and the PSP test showed 60 per cent excretion in two hours. At the time of discharge nineteen days after admission, B.U.N. was 28 mg. per cent, urinary output about 2,000 cc. per day, weight 68.4 kg., blood pressure 130/78, hematocrit 34 per cent. The specific gravity of the urine was 1.010, and there were no protein, no casts, no R.B.C., and no W.B.C. The patient was ambulatory, cheerful, and feeling quite well.

He was transferred to the Murphy Army Hospital for convalescence and further observation on January 22, 1951. While at Murphy the patient had an attack of influenza, from which he made an uneventful recovery. He also developed a persistent anemia, which did not respond to iron and liver therapy. This was treated by two transfusions of 500 cc. each of whole blood on February 5th and 6th, with good response.

After thirty days of convalescent leave, the patient returned to the Peter Bent Brigham Hospital for follow-up studies. Laboratory studies at this time were as follows: the urine concentrated to a specific gravity of 1.026, B.U.N. was 11 mg. per cent, PSP 15 per cent first fifteen minutes, and 55 per cent in two hours, BSP 4 per cent retention in 30 minutes. Alkaline phosphatase 2-7 (Bodansky units), thymol 1+, hematocrit 31 per cent, sedimentation rate 8, W.B.C. 6,250, with 60 neutrophiles, 13 bands, 31 lymphocytes, 1 monocyte, and 5 eosinophiles. The blood smear appeared normal. The stool was negative for blood. Insulin clearance was 85 to 90 cc. per minute and renal plasma flow was 350 cc. per minute. These figures are slightly below normal value. It was Dr. Merrill's opinion that the persistence of anemia was in keeping with the temporary renal disease, and that the prognosis was good.

After two days of observation and study the patient was returned to Murphy Army Hospital on March 21st, where laboratory studies confirmed the Brigham findings of essentially normal renal and liver function. A low hemoglobin of 60 per cent was treated at Murphy by whole blood transfusions, and the patient was returned to full military duty in excellent general condition, three and one-half months after the beginning of his illness.

Final Diagnosis: Acute carbon tetrachloride poisoning with toxic hepatitis and lower nephron nephrosis.

SUMMARY

A patient with severe lower nephron nephrosis and toxic hepatitis, due to carbon tetrachloride, was treated by the artificial kidney, with recovery. Perhaps this patient might have recovered without recourse to dialysis, but in any event this procedure

most certainly was a powerful and welcome aid to his recovery.

It is problematical whether the alcohol intake during the week of exposure to carbon tetrachloride was material to the development of the disease. But regardless of the probabilities in this case, the role of alcohol as a precipitating agent in such circumstances must not be minimized. Indeed, alcohol[13] in a few well-documented, thoroughly studied instances has been almost positively implicated as an essential auxiliary factor in the causation of acute tubular nephrosis due to carbon tetrachloride, although the difficulties of establishing such a causal relationship must be considerable.

Once, again, attention is called to the fact that carbon tetrachloride vapor is a deadly renal poison as well as a destructive hepatic toxin.

REFERENCES

1. Kolff, W. J.: Artificial Kidney. Cleveland Clin. Quart. **17**:216-228, 1950.
2. Alwall, Nils, *et al.:* On the Artificial Kidney. Acta Medica Scandinavica, **137**:233-236, 1950.
3. Alwall, Nils, *et al.:* On the Artificial Kidney III. Acta Medica Scandinavica, **131**:237-250, 1948.
4. Alwall, Nils, *et al.:* Clinical Extracorporeal Dialysis of Blood with Artificial Kidney. Lancet, **1**:60-62, 1948.
5. Merrill, John P.: Present Role of the Artificial Kidney in Clinical Therapy. Ann. Int. Med. **33**:100-106, 1950.
6. Murray, G., *et al.:* Artificial Kidney. Brit. Med. J. **2**: 1949.
7. Murray, G., *et al.:* Development of the Artificial Kidney. Arch. Surg. **55**:505-522, 1947.
8. New Ways of Treating Uremia. Brit Med. J. **2**:1041, 1947.
9. Palmer, R. A., and Rutherford, P. S.: Kidney Substitutes in Uraemia: Use of Kolff's Dialyser in Two Cases. Canad. M. A. J. **60**:261-266, 1949.
10. Lowsley, Oswald S., and Kirwin, Thomas J.: Artificial Kidney: Preliminary Report. J. of Urol. **65**:163-175, 1951.
11. McNaughton, Robert A., and Burchell, Howard B.: Paralysis with Potassium Intoxication in Renal Insufficiency. J. A. M. A. **145**:481-483, 1951.
12. Merrill, John P.; Smith, S., III; Callahan, E. J.; and Thorn, G. W.: The Use of an Artificial Kidney: II. Clinical Experience. J. Clin. Investigation. **29**:425-438, 1950.
13. Merrill, John P.: Personal communication.

Interrupt Sympathetic Nerves to Reduce Pain From Cancer.

Severe chest, abdominal or pelvic pain due to advanced malignant disease can be greatly relieved by interruption of the sympathetic nerve paths involved, according to Dr. I. Ridgeway Trimble and Dr. Samuel Morrison of the Johns Hopkins Medical School and the University of Maryland School of Medicine, Baltimore. This can be accomplished by injecting 95 per cent alcohol into the nerves involved, destroying them, or by surgical severance of the nerves affected, the authors stated in the April 5 Journal of the American Medical Association.

They reported on 11 cases where relief was obtained by the use of alcohol injections, and one case where relief resulted from severing the nerves, adding:

"Although the relief was not always complete, or sustained even when at first complete, the improvement was so striking that we believe that in all cases of this sort every effort should be made to determine (1) the sympathetic nerve paths involved in the area of pain and (2) the most expeditious and least harmful manner in which to carry out appropriate sympathetic denervation [interruption of the nerve supply].

The pain, they said, may be due to the effect of the deficient blood supply in the region of the nerve endings because this deficiency renders them hyperirritable. It may also be due to the chemical changes in the tissues or organs supplied.

The problem of the control of this type of relentless, increasing, often agonizing pain is frequent, according to the authors. Pain relieving drugs, particularly the morphine derivatives, have their place, but the relief offered is brief, and, in many cases, pain reappears with greater severity.

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THE NEUROSES OF EVERYDAY LIVING

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There is one characteristic of the American people which probably is a by-product of their need to succeed, namely, a tendency to overdo. If something is considered good, then more would be better—more would be better, and so on until the results are not better but often painful and destructive for the people involved. The thesis of this paper is that when people suffer from such exaggerations their behavior has certain characteristics and that these characteristics are found in all people suffering in such a manner.

This year is especially outstanding because of the presidential election. One group of voters will be vying against another to win. Most of the voters of the country will consider themselves Democrats or Republicans. They will do as the party of their choice instructs them and they will feel as they consider a Republican or a Democrat should feel. They will become members of a group which controls their lives and determines their destinies. The analysis of why a person joins one party and not another would lead us far afield. Indeed, we would have to study the details of each individual's life to determine the reasons for joining and being carried along in any particular mass movement.

There are many group activities similar to political party behavior which influence the lives of everyday Americans. Sometimes the influence works out for the good of the individual involved and sometimes both the individual and the community are injured. Disturbances of health and happiness often follow which may lead to gross behavior disorders in both the individual and the group. The Mental Hygiene Society is interested in the prevention and cure of behavior disorders so it behooves the Society to review the behavior of groups so as to be able to recognize those types of behavior which may become harmful.

Sociologists and social psychologists have been studying the characteristics of groups and group activity for years. They have reached several conclusions regarding the nature of group behavior. According to Kreck and Crutchfield in *The Theory and Problems of Social Psychology*, a group does not mean a collection of individuals characterized by some similar property. Thus, for example a collection of Republicans or farmers or Negroes, is not a group but a class of people. The term "group" refers to two or more people who bear an explicit psychological relationship to one another. A collection of Republicans working together to win an election becomes a group. A Farmer's Cooperative is a group. The various members exist for each other in some significant way. The criterion that can be applied for recognizing a group is whether or not the behavior of other members in the supposed groups has any direct influence on the behavior of the given individual and whether his behavior has direct effect on the other members. This influence may be slight and vague. It is psychological and not material but is definite enough to be recognizable.

A person, a community, a state or national organization, can act in a manner so distorted and so full of danger that the action must be considered diseased even though no one seems aware of the diseased state. Football as a sport, for instance, has many values both for those who play and for those who watch, yet of late, the game and all that goes with it has become a monster which menaces the integrity of our youth and distorts to an alarming degree the behavior of our colleges and universities. The behavior of some religious sects amounts to a masochistic orgy when self-sacrifice and suffering are exaggerated to an extreme degree. Labor unions have done much for the working man, yet they in turn may evidence abnormal behavior which is a menace to the nation. It may be concluded, I believe, that just as individuals behave at one time in a normal fashion and at another in an abnormal manner, so groups may evidence well balanced behavior at one time, yet at another show most unusual and bizarre conduct. Mass hysteria as seen during mob violence is well known. Nazi Germany was considered to be suffering from a national psychosis. The state of war must appear to the detached observer as international insanity. These conditions could be called group neuroses.

To the individual caught up in such a mass movement, nothing seems to be wrong. This individual attitude of innocence makes it worthwhile to study the situation of that individual caught up in a group when that group has ceased to act in a normal manner. Mass behavior of any sort is composed of individual behavior of a similar nature which is as badly diseased as the group action is diseased. If we observe this individual, however, he shows no signs of suffering. He is not thought to be abnormal by his fellows nor by those who are not caught up in the mass movement. He is not suspected of either neurosis or psychosis.

True neuroses and psychoses are forms of behavior which always arise from within the person and are developed on an individual basis. While a person with a neurotic reaction may be a member of a group, and his neurosis lead him to aid in the group distortion, yet at heart he is anti-social since he wishes to control others by his own methods for his own ends. His reaction is one that cannot be shared with anyone else. He is a person who attempts to solve life's problems in his own individual way by his own techniques. These techniques are often exaggerated to such a degree that they irritate the group. The group shuns, excludes, ostracizes and often attacks this individual who dares too much individuality.

The actions of each of these individuals—namely, the person suffering from an individual neurosis and the person taking part in a group distortion—have many similarities. First, in each there is an exaggeration of a form of behavior beyond the limits of what, to the clear-thinking individual, seems warranted by the circumstances. In the individual neurotic, the pain or the paralysis cannot be explained by anatomical structure or by reasonable disease. In the group distortion, the best interests of the individual are obviously sacrificed beyond the demands of rational needs. Second, both forms of behavior complicate interpersonal relations. In the long run, each tends to make more difficult the ability of people to live together. This trend may lead to infringement on the laws of the land, to the impoverishment of people, or to actual conflicts within individuals, between individuals or groups of individuals. The first type of behavior, when the law is broken, is called criminal. The second, where people are impoverished materially or spiritually, is often disguised as public welfare or deficit spending. The third form of neurotic behavior, arising from conflict, may be made manifest as symptoms on the individual level, but as race or religious prejudice on the community level, and as war on the international level.

The similarity of individual neurotic behavior and group neurotic behavior is that the cause for the excess is not known to the performer of the action. The neurotic headache is said to come from a bad tooth, but the real cause is the hatred of a mother-in-law. The prejudice against the Jew is said to be because the Jew has all the money in the world, while the real reason is the group's own insecurity and perhaps a need to escape from feelings of self-hate. The cause for war is often said to be for the sake of democracy, while the actual cause is the lack of self-confidence which produces fear and the hate fear engenders.

Finally, causes for this exaggeration common to individuals and to groups of individuals may be understood by both the individual and the mass, yet neither the individual nor the group is able to modify the irritating behavior sufficiently to end the irritation. This represents a resistance to change resulting from the long period of training which produces the abnormal behavior, and from the many secondary gains which accumulate as the creation of the reaction is effected. War offers a very good illustration of this situation. The causes of war are well understood; everyone agrees that war as a technique for solving man's hostility to man is outmoded, yet we live under a constant threat of this form of group psychosis. Besides the awareness of the nature of either form of behavior, there must be a change in the manner of acting out the cause, backed by a determination to get well, before a cure can be accomplished.

The neurosis of the individual caught up in a group exaggeration, and the neurosis which is entirely a result of the individual's own efforts to get along in life, have many differences as well as similarities. One of the outstanding differences is that the perpetrator of group action has no idea that he is sick, nor is he considered to be odd by anyone in his social setting. In fact, he may be looked upon as an example of correct behavior. He may be given medals and promoted by members of the group to places of leadership. The adoration of the group often calls

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for senseless selection of such a hero for a position for which he is in no way qualified. Also, persons not entangled in the group distortion consider the behavior of the individuals as acceptable. What is more unreasonable than a mass of rabid individuals of late middle age rushing pell mell over the highways, where death lurks at every turn, just to be in on the "kick-off"? Few would consider these persons neurotic even when they sit out on concrete seats in a blizzard while other men whom they hardly know and can scarcely see, run up and down a frozen field assaulting one another. The causes for this abnormal exaggeration of behavior are also behind the force that makes some college presidents perjure themselves for the sake of winning football teams. No one considers the president's action proper, although it is condoned, while the actions of middle-aged alumni are not questioned. Indeed, the abnormalities of behavior of individuals carried along by groups is so common to everyday living that it is difficult to designate the point at which the disorder becomes a disease. This depends, I believe, not so much on the behavior of the group but on the significance of the behavior to the individual concerned. Therefore, this condition is not a mass neurosis but one of individuals.

A definition that would cover the idea embraced in the discussion given above can now be developed. A neurosis of everyday living occurs when socially accepted behavior is exaggerated to such a degree that it interferes with interpersonal relations and the performer is unaware of the actual cause for his behavior, or if he becomes aware, is unable to modify the exaggeration. In contradistinction to a person with an individual neurosis, the persons showing the reaction do not consider themselves sick. They are not considered sick by the others in the group or by the bystanders who observe their behavior.

The attitude of a large number of individuals toward the game of football represents this form of neurosis. The behavior of many Americans at Christmas offers another example. Keeping up with the Joneses represents another exaggeration that disturbs comfortable living. The influence of labor unions and of big business on interpersonal relations is worthy of study. The mass hysteria on New Year's Eve is an example of a variation in the same disease. Deficit spending could be considered as a neurosis of everyday living at the national level. This unreasonable behavior probably develops as an exaggeration because of the long training given the citizens of this country in buying on the installment plan. When the citizens of Virginia are referred to as Democrats, that is a classification. When they elect a candidate, that is normal group behavior. When we as Democrats allow a self-perpetuating organization to control our destinies over a generation in spite of the fact that this organization often acts contrary to our wishes, then we as individuals are suffering from a neurosis of everyday living. War represents the example of an international exaggeration of socially accepted group hostility which is called nationalism. There are many such distortions which affect the lives of us all. Country club life may destroy some individuals. The idea fostered by many merchants that society demands a yearly crop of debutantes is a racket for some, and a neurosis for others. How can we expect to end the abnormal relations beween the colored and the white as long as many of our churches draw the color line? Understanding of the causes and effects of such behavior does not help many of these individuals who are swept along in the group. They must be able to act on their knowledge. They must divorce themselves from the group. To do this, they need the support of another group which allows them to act in a less exaggerated fashion.

Alcoholics Anonymous represents such a form of group therapy, organized on the community level, to treat the neurosis of alcoholism. The Interracial Commission is another group treating a neurosis of everyday living by attempting to eliminate race prejudice. The Mental Hygiene Society of Virginia is working as a group to eliminate the misunderstandings of human relationships which produce mental disease. There is the Department of Education, the Alcoholic Beverage Control Board, and the executive organization of the State, acting as groups to eliminate exaggerations of behavior which interfere with interpersonal relationships.

Nationalism is often exaggerated until diseased. Patriotism is a normal human response within narrow limits but soon gets out of bounds to such a degree that it is dangerous. The International Congress of Mental Health recently held in Mexico City represents a form of group therapy aimed at exaggerated nationalism, while the Olympic games and the Davis Cup matches are other forms of therapy

aimed at the same disease. The United Nations is organized primarily to prevent distortions of behavior on the international level. It controls opium traffic, takes new methods of farming to India, etc., besides allowing the different nations to ventilate their hostilities. Thus, there are now in existence many forms of group therapy directed toward the amelioration of the neuroses of everday living.

One unique American quality is the ability to organize. This quality has made mass production possible and was one of the major reasons for our success in the last war. The ability to organize meets some need of our people, so has led to the formation of thousands of clubs, societies, and other forms of organization throughout the length and breadth of the land. The neuroses of everyday living can best be treated by groups that understand the menace of the neuroses, and therefore can offer an escape into a less exaggerated form of behavior to the individual who has been swept up in a mass movement.

Recently a middle-aged man came into our clinic. He complained that his right arm was paralyzed. The arm hung in a limp fashion. Apparently he could not move it. Also, when the arm was examined further it was found to be anaesthetic to pin prick. Sharp instruments could be driven through the skin while the patient sat smiling. He declared he could not feel any pain. All examinations of the arm failed to show any defect. The blood flow was normal, the nerve supply was normal. Reflex activity was normal. The man was cured rapidly. He left the clinic with a normal arm but he was not quite so happy. In the course of our work with him, it had developed that he hated his wife. She had demanded that he cut wood. His paralyzed arm had enabled him to frustrate her demands. He had unconsciously separated his arm from the rest of his personality so that no will power of his could make it move or feel. In the case of the individual this is known as an hysterical reaction. The arm is said to be blocked off or excluded from the rest of the person. The cause in this case was the hatred and fear of the wife and the determination to frustrate her wishes. There was perhaps, also, a dislike of wood chopping.

In 1865, a constitutional amendment made the colored man a citizen of the United States. The southern states were forced to ratify this amendment. There were many feelings of hatred and hostility toward their recent deadly enemy who now demanded that their former slaves be recognized as their political and social equals. The acceptance of the demanded role was too much and an hysterical sort of blocking off came into existence known as segregation. By means of this reaction, the citizen was able to exclude the colored man from his life. He didn't exist. He was put in special places that could be ignored. He could not come out of these areas unless he assumed a role of servility or appeasement which might be called the "Uncle Tom Reaction."

Segregation became a fixed pattern of behavior probably initiated because of the hostilities engendered by the War Between the States and by the stupidity of those in charge of the reconstruction period. The colored man of that day was illiterate and dependent. He was totally unprepared for citizenship or to accept a position of social equality. Segregation was a method of defense created by the white man to thwart a hated order and to help solve an intolerable situation. Segregation was accepted by the colored man as an escape from many situations that were embarrassing to him. The similarity of the hysterical blocking off of an arm and the excluding of colored people must be apparent to everyone. Segregation could be called a form of neurosis of everyday living. People of the south are caught up in this reaction and carried along regardless of their own reasons for acting the part assigned them. Certainly they could not be called sick because they act out their roles, yet by doing so, they are perpetuating a form of behavior which is contrary to the fundamental principles of our democracy.

Segregation is like individual neuroses in many ways. The debacle of 1861-1870 may have precipitated the disease, but its roots lie in the distant past. The reason for its present existence is due to outmoded ideas of one sort or another and to secondary gains that accrue to certain individuals thus making it worthwhile to sustain the reaction. As in all other forms of group neurosis, each individual has his own reasons for joining the movement. In one case it is ignorance, another—fear, another—insecurity and another—a shrewd awareness that segregation reduces competition thus making more jobs available to less efficient people. To others, segregation gives a monopoly in certain forms of business.

A certain amount of race prejudice can be con-

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sidered normal but when it develops to such a degree as is manifested toward the colored people in the United States, it interferes with interpersonal relations and becomes a neurosis of everyday living. The treatment of this disorder can be attempted by individuals, but group therapy would be much more effective.

The best attack would be at the causes which are grounded in race prejudice. The emphasis should be on democracy and the assault on the false concept that the American is always a Protestant Anglo-Saxon. Although there are many kinds of people, there is only one type of citizen and that is a first class citizen. In the Army, race prejudice was often forgotten because men worked together for a serious cause. Groups devoted to a cause would have no place for prejudice. The ability of persons to get along with each other depends to a large extent on their ability to identify. Their ability to relate depends on their ability to accept qualities of one another. Their relatedness, therefore, depends on the possibility of their knowing each other as individuals so that they can find acceptable qualities which will permit identification. It is impossible to identify with a stranger, but if that stranger has value in promoting a common cause the strangeness disappears and identification is possible.

The Mental Hygiene Society of Virginia would be an excellent group to initiate the therapy of the neurotic reaction known as segregation. If all members of the Society worked together as a team in the cause of mental health, people would be seen as people and not as colored or white. Therefore, the Mental Hygiene Society in its present program has a great opportunity to step further into the community. It can become more effective by stimulating the many organizations of the state to become interested in the treatment of the neuroses of everyday living. Now is the time to describe these distortions of human behavior so they can be recognized by the active groups. Now is the time to show in what way the groups can apply adequate therapy.

New Books.

We list below the names of some of the newer books at the Tompkins-McCaw Library, Medical College of Virginia, Richmond 19, which may be borrowed under usual library rules:

Blake—The present state of antibiotic therapy, 1951.
Conel—The Postnatal development of the human cerebral cortex. Vol. 4. 1951.
Conn, ed.—Current therapy. 1952.
Earle—A guide to children's dosages, 1951.
Grant and Reeve—Observations on the general effects of injury in man, 1951.
Hampton—Wounds of the extremities in military surgery, 1951.
Hartwell—Surgery of compounds which have been tested for carcinogenic activity, 2nd ed. 1951.
Hartwell—Survey of compounds which have been tested for carcinogenic activity. 2nd ed. 1951.
Husa—Pharmaceutical dispensing. 4th ed. 1951.
Krantz and Carr—The pharmacologic principles of medical practice, 1949.
Levine—Clinical heart disease. 4th ed. 1951.
MacBride—Signs and symptoms. 2nd ed. 1952.
MacCallum, et al.—Infective hepatitis, 1951.
Mantell—Adsorption, 2nd ed. 1951.
Moloney—The battle for mental health, 1952.
Page—Hypertension. Revised Printing. 1951.
Smith and Walker—Penicillin decade. 1941-1951. 1951.
Surgical practice of the Lahey clinic, 1951.
Sutton and Sutton—Handbook of diseases of the skin. 1949.
Welch and Lewis—Antibiotic therapy. 1951.
Woolley—A study of antimetabolites. 1952.

AMA to Set Up Socio-Economic Files.

The AMA plans to centralize its medical socio-economic files in the near future. At its last meeting, the Board of Trustees authorized the appointment of an assistant librarian to assemble and catalog this material from the various councils, committees and bureaus of the Association. Eventually a complete history of AMA policies and attitudes will be compiled from this source.

NON-TRAUMATIC GAS GANGRENE

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Although gas gangrene is a well known clinical disease entity when associated with traumatic lesions, particularly war wounds, it is not generally appreciated that clostridial infections may supervene in non-traumatic "medical disease". That this complication is not rare is illustrated by the fact that the following four cases were observed at the Norfolk General Hospital within a period of less than a year.

Case Report

Case 1. The patient was a 62 year old white female, who was admitted to Norfolk General Hospital in September, 1950. She had been seen by her physician the night prior to admission and had complained of vague pains in her left shoulder. The next morning she could not be aroused. On examination in the hospital the patient was in a semi-comatose state and no blood pressure or pulse was obtainable. The heart sounds were faint, the apical rate was 100, and there were runs of extrasystoles. On abdominal palpation, there was an orange-sized, fairly movable, mass in the right lower quadrant.

Fig. 1.—(Case 1).—Note the edema and discoloration of the left arm and right hand.

The most striking findings were in the skin and musculature. The left upper arm was swollen, tense and deeply discolored with a bluish tinge. There was palpable crepitation over the area. During her short hospital stay there was a visibly rapid spreading of the bluish discoloration and crepitation to involve the right hand and part of the left anterior chest wall (Figure 1). Tissue fluid aspirated from the left arm revealed gram positive rods morphologically resembling Clostridium welchii. She was placed on therapy but failed to respond and expired three hours after hospital admission.

Autopsy revealed that the patient had an adenocarcinoma of the cecum with retroperitoneal perforation, and necrosis and crepitation of the retroperitoneal tissues. The involved portions of the arms and chest wall also showed necrosis, edema, and crepitation, and microscopic sections of the lungs revealed organisms compatible with Clostridium welchii. The organism was grown in cultures from the involved areas.

Case 2. The patient was a 52 year old white male, treated for six months prior to admission for a refractory anemia of uncertain nature. He was admitted in July, 1951, with a history of having a severe pain in his left thigh the night before admission. When he was seen in the hospital early the next morning the patient was in a semi-comatose state with a blood pressure of 60/50. The physical examination was essentially negative except for a visibly spreading cyanosis, edema, and crepitation

Fig. 2.—(Case 2).—The thigh is markedly swollen with areas of discoloration. Large hemorrhagic blebs are present.

over the left flank and thigh. The patient failed rapidly and he expired one hour after admission.

Autopsy revealed hemorrhagic blebs over the left thigh (Figure 2) and massive necrosis, edema and crepitation of the left thigh, left buttock, penis and scrotum. There was also bloody pleural and pericardial fluid. Culture of the skin blebs revealed Clostridium welchii and these organisms were also identified in the lung on microscopic examination. No portal of entry for the organism was found.

Case 3. The patient was a newborn white male infant who, soon after birth, exhibited signs and symptoms of acute intestinal obstruction. The day of birth an ileo-colostomy was done for congenital atresia of the lower ileum. Post operatively the patient continued to show signs of intestinal obstruction and six days later had an ileo-sigmoid colostomy performed. He expired two days later.

Autopsy revealed gangrene of the ascending colon with crepitation of the bowel, mesentery, and liver (Figure 3).

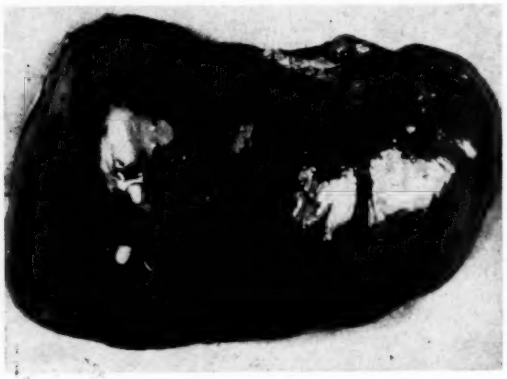

Fig. 3.—(Case 3).—The liver contains innumerable gas bubbles of varying size. A large bleb is on the surface.

Case 4. The patient was a 53 year old colored male who was admitted to Norfolk General Hospital in September, 1950, with a diabetic ulcer of the right toe of eight weeks duration. The patient was a known diabetic of fifteen years duration but had failed to receive insulin for two days prior to admission. On admission the patient was acutely ill and in diabetic acidosis. On examination the right toe was gangrenous and there was swelling and crepitation over the dorsum of the foot. Smear and culture of this area revealed Clostridium welchii. The patient was placed on insulin, fluids, large doses of penicillin and gas gangrene antitoxin. Three days after admission a subastragalar amputation was done. With the infection gone, the patient's course became much smoother and six days later a lower leg amputation was done. The patient's post-operative course was uneventful and he was discharged with no evidence of infection.

DISCUSSION

Clostridial infections are conveniently divided into two groups[1]: (1) Clostridial myositis, and (2) clostridial cellulitis.

Clostridial myositis, which is illustrated by cases 1, 2, and 3, consists of growth of the organisms in dead muscle. From this focus, exotoxins cause necrosis of adjacent muscle, and spread of the bacillus progresses as the necrotizing process advances. The process is accompanied by a profound toxemia with circulatory collapse, a severe anemia, early onset of coma, and a rapidly fatal course.

The source of the organisms in cases 1 and 3 seems almost certainly to be the intestinal tract. It has been shown that Clostridium welchii is uniformly present in human feces[2]. In case 2, the source of the organism is not apparent and one can only speculate on the possibility of an externally introduced contaminent which remained dormant until activated by certain conditions favorable to growth of the organism. It has been shown that infection may not occur until ten years after contamination[3]. It has been amply demonstrated in traumatic cases that wounds may be contaminated by clostridia, yet free of clostridial infection. In several series[3] ten to forty per cent of wounds were contaminated by clostridia, but only three-tenths to five and two-tenths per cent developed infections. It is obvious, therefore, that certain predisposing factors must be present before infections occur. Chief among these are: (1) tissue hypoxemia and (2) foreign material [1,4,5,6,7]. All three cases of clostridial myositis presented had hypoxemia of the gangrenous tissues. In case 1 there was circulatory collapse secondary to a perforated cecal carcinoma. In case 2, there was a severe anemia likewise producing generalized tissue hypoxemia. In case 3 there was actual necrosis of the bowel owing to interference with its blood supply.

Foreign material in the form of feces was present in the tissues in cases 1 and 3. In case 2 there is no evidence that foreign material was present.

Clostridial cellulitis, which is illustrated by case

4, consists of the spreading through tissue planes of an exudate containing the clostridial organisms. There may or may not be gas production, but the necrotizing change in muscle is not prominent, and the profound toxicity of clostridial myositis is absent. In case 4, the source of the organisms was probably external through the long standing ulcer. The predisposing factor of tissue hypoxemia resulted from severe arteriosclerosis of the leg vessels. The poor resistance to infection which characterizes diabetes mellitus may also have favored extension of the process.

The clinical course in the cellulitis type of clostridial infection is relatively benign compared to the fulminating nature of the diffuse clostridial myositis. Although the diagnosis was made antemortem in cases 1 and 2 and the proper therapy instituted, the course was so rapid that treatment was of no avail, and the patients expired respectively three hours and one hour after hospital admission.

In case 4, although the patient was admitted in severe diabetic acidosis, the prompt administration of large doses of penicillin and gas gangrene antitoxin kept the lesion localized until the diabetic condition of the patient was stabilized sufficiently to allow surgical removal of the lesion. The therapy of lesions of this type does not differ in its essentials from the recognized therapy of gas gangrene associated with trauma.

SUMMARY

Four cases of non-traumatic gas gangrene have been presented and the frequency of the condition stressed. The predisposing factors and source of the organisms are discussed. The distinction between clostridial myositis and clostridial cellulitis and the difference in clinical course and response to therapy of these two entities is considered.

BIBLIOGRAPHY

1. MacLennon, J. D.: Anaerobic Infections of War Wounds in the Middle East. Lancet **2**:63, 66-94, 1943.
2. Wilson, G. S., and Miles, A. A.: Topley and Wilson's Principles of Bacteriology and Immunology, Third edition, **1**: pp. 858-898, Williams and Wilkins Company, Baltimore. 1946
3. Altemeier, W. A., and Furste, W. L.: Collective Review of Gas Gangrene. International Abstracts of Surgery **84**:507-523, 1947.
4. Power, R. W.: Gas Gangrene and Vascularization of Muscle. British Med. Jour. **1**:656, 1945.
5. Birchall, R.: Shock Caused by Extremity Wounds. Amer. Jour. Surg. **76**:51-57, 1948.
6. Brown, R. K., and Melch, E.: Gall Bladder Gas Gangrene. Gastroenterology **10**:626-633, 1948.
7. Gershberg, H.: Some Observations on War Wounds with Particular Reference to Stormy Fermentation. Military Surgeon **100**:505-514, 1947.

Proper Medical Management of Older Worker Necessary.

With proper medical management by industry, employees over 40 years of age can be satisfactorily employed, in the opinion of Dr. Rufus B. Crain, medical director of the Kodak Office and Camera Works, Eastman Kodak Company, Rochester, N. Y.

In an article in the current Archives of Industrial Hygiene and Occupational Medicine, published by the American Medical Association, Dr. Crain told how his company manages its 30,000 workers, 39 per cent of whom are over 40.

One of the most essential elements for proper management of the older employee is selective job placement, according to Dr. Crain. If this is correctly done, employees with such impairments as heart and blood vessel diseases, diabetes, arthritis, arrested pulmonary tuberculosis, amputations, and defective hearing and vision will prove as efficient as employees without such afflictions.

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CHLOROMYCETIN PALMITATE— CLINICAL EVALUATION IN ALLERGIC AND NON-ALLERGIC CHILDREN AND ADULTS*

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This study was prompted by the appreciation of the necessity of having a liquid form of Chloromycetin for administration to those patients who are unable to take the crystalline or capsular form. Chloromycetin Palmitate is a palatable liquid suspension composed of propylene glycol, carbowax 1000 monostearate, sucrose, sodium carboxy-methylcellulose, alcohol and flavoring and contains 250 mg. of the ester, or 125 mg. of Chloromycetin in 4 cc. The terminal hydroxol group of the propane diol side chain has been replaced with an ester group which contains 57.6 per cent of Chloromycetin.

Chloromycetin Palmitate is less toxic than the crystalline Chloromycetin for mice, rats, and dogs in a ratio of approximately two to one. Adults who have received as much as 200 mg. per kilogram twice daily for ten days showed no systemic, neurologic, hematologic or urinary dysfunctions.

In the animal experimentation, approximately 1.5 per cent of the ester is excreted in the urine of the dog in an unchanged form. It has been noted that Chloromycetin continues to be excreted in the urine for a considerable period of time after a low blood level has been reached. This would indicate that the absorption of Chloromycetin and its deposition in the tissues occurs rapidly, followed by a slow, continuous release.

The liquid Chloromycetin, in itself, possesses practically no antibiotic effect until it is hydrolyzed. Thus, the rate of hydrolysis of the ester to the free alcohol form, Chloramphenicol, determines the antibiotic action of the palmitate. Numerous factors determine the rate and degree of decomposition, the most important of which is possibly the emulsification through the action of bile and the splitting action of intestinal lipases.[1]

We will, in no way, attempt to review the literature on the subject of crystalline Chloromycetin and its correlation with other antibiotics.

CLINICAL STUDY

The 250 patients studied are divided into two groups, the first, a pediatric group with ages varying from three months to ten years. These patients were taken from an active clinical pediatric practice. In certain instances an allergic factor was considered but the majority of the patients were non-allergic.

The second group was comprised of patients selected from a practice limited to allergy and internal medicine.

This is primarily a clinical study and we have not attempted in any way to leave that level. In very few instances did we carry out bacterial sensitivity tests with Chloromycetin discs. In those patients in which sensitivity studies were carried out, a parallel was noted in the clinical and bacteriological studies.

Table 1 shows that of 250 cases treated, 194, or 77.6 per cent, were improved. This table represents the total number of cases treated which encompasses 25 different clinical impressions or diagnoses.

Respiratory manifestations were seen in 212 cases: 108 were diagnosed as La Grippe; 28 as bronchitis; 30 acute upper respiratory infections; 21 tonsillitis; 6 laryngotracheobronchitis; 2 broncho-pneumonia; 14 asthmatic bronchitis; one sinusitis and bronchitis; one otitis media, and one pneumonitis with pulmonary infarction.

One hundred and eight cases of La Grippe were treated with a high percentage showing a satisfactory improvement following the administration of the drug. One must remember that in the treatment of La Grippe by nonspecific measures, many patients may improve without antibotic therapy. There have

*The drug for this study was supplied through the courtesy of Dr. E. A. Sharp, Director, Department of Clinical Research, Parke-Davis and Co.

Presented before the annual meeting of the Medical Society of Virginia, at Virginia Beach, October 7-11, 1951.

1. Personal communication Parke-Davis and Company.

Table I
250 CASES ARE GROUPED ACCORDING TO CLINICAL DIAGNOSIS AND RESPONSE TO TREATMENT

CLINICAL DIAGNOSIS	*No. of Cases*	*Improved*	*Unimproved*
La Grippe	108	97	11
Bronchitis	28	24	4
Upper Respiratory Infection	30	25	5
Tonsillitis	21	14	7
Whooping Cough	5	0	5
Measles	6	0	6
Measles and Otitis Media	1	1	0
Laryngotracheobronchitis	6	4	2
Broncho-pneumonia	2	1	1
Asthmatic Bronchitis	14	11	3
Sinusitis and Bronchitis	1	1	0
Roseola	3	0	3
Nonspecific Stomatitis	4	1	3
Diarrhea	2	2	0
Otitis Media	1	1	0
Impetigo	1	1	0
Contact or Atopic Dermatitis with Pyoderma	5	5	0
Dermatophytid with Pyoderma	4	2	2
Urticaria and Angioneurotic Edema with Infection	1	0	1
Pruritus Vulvae and Ani with Pyoderma	2	2	0
Acute Cystitis	1	1	0
Pneumonitis with Pulmonary Infarct	1	0	1
Thrombocytopenic Purpura	1	0	1
Infectious Mononucleosis	1	0	1
Pyelitis Associated with Renal calculus	1	1	0
TOTALS	250	194 77.6%	56 22.4%

been very few complications shown by the group and this is likely explained by the absence of secondary infection controlled by the drug.

In the treatment of asthmatic bronchitis, the results were satisfactory as related to the severity and length of illness.

Skin manifestations represented 13 cases which included 5 contact or atopic dermatitis with pyoderma; 4 dermatophytids; one impetigo with pyoderma; two pruritus ani and vulvae with pyoderma, and one urticaria and angioneurotic edema with secondary infection.

The consideration of the dermatologic manifestations was primarily for the control of the secondary pyoderma. Some of the patients showed a general toxic, constitutional reaction to the infection; however, the majority did not. The two most startling cases were those of pruritus vulvae in which the pyoderma was controlled quite rapidly.

Communicable diseases comprising 15 cases were grouped as follows: whooping cough, 5; measles, 6; roseola, 3; measles with otitis media, one.

The miscellaneous group was represented by 4 cases of nonspecific stomatitis of probable viral etiology; 2 of diarrhea; one acute cystitis; one thrombocytopenic purpura; one infectious mononucleosis, and one pyelitis with renal calculi.

Two cases of clinical infectious diarrhea included in the miscellaneous group were treated previously by other specific therapy from which they did not respond. Chloromycetin Palmitate was administered and one patient who had had nausea and vomiting with previous other medications tolerated the drug. Stool cultures were not done in either case.

The response of these patients to treatment is grouped according to "Improved" or "Unimproved." There was no definite designation as to whether the patient had a fair, good or excellent response. If there was any question of improvement, it was designated as "unimproved."

Of the 250 cases represented by this study, 56, or 22.4 per cent, were "unimproved." In this group are included 5 cases of whooping cough. Payne *et al*,[2,3] have shown by controlled studies that Chloromycetin is of value in the treatment of whooping cough. The unfavorable response found here may be due to a small series and the fact that the diagnosis

2. Payne, E. H., *et al.* Pertussis Treated with Chloramphenicol, J.A.M.A. 141:1298, Dec. 31, 1949.

3. Payne, *et al.* Chloromycetin as A Treatment of Pertussis, J. Mich. St. M. Soc. 49-450, Apr., '50.

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was clinical without laboratory confirmation. One appreciates that the definite diagnosis of whooping cough is most difficult under optimum conditions. As would be expected, the patients having roseola and measles did not respond.

Table II shows the dosage used according to age.

Table II
A COMPARISON IS MADE BETWEEN AGE, DOSAGE, AND TOLERANCE

DOSAGE	AGE (IN DECADES)											Total
	3-6 Mos.	6 Mos. 1 Yr.	1-3 Yrs.	3-5 Yrs.	5-10 Yrs.	2	3	4	5	6	7	
40 mg./lb.	2	8	27	10	7							54
80 mg./lb.	6	16	60	47	28	1						156
1-1.9 gm./day		1	2	2	3	1		3		1	1	14
2-2.9 gm./day							1	4	2			7
3 gms. or more					1	2	3	4	5	1	3	19
TOTAL	8	25	89	59	37	4	4	11	7	2	4	250

In the pediatric group, a scale of 40 or 80 mg. per pound was set up, and in the older group, the dosage was set up on the basis of a total dosage of from one to 3 gms. during a 24 hour period.

In a group of 210 cases, 54 received a dosage of 40 mg./lb., and in 156 instances, 80 mg./lb.

Fourteen cases received a total 24 hour dosage of 1—1.9 gms., and 7 cases received 2—2.9 gms. per 24 hours. There were 18 who received 3 gms. or more. One patient tolerated 6 gms. daily without any reaction.

cent, of the 250 cases treated. These reactions were characterized by nausea and vomiting. One reaction occurred in the group of 27 with a dosage of 40 mg./lb. in the age group 1-3 years; and 2 out of 47 who received 80 mg./lb. in the age group 3-5 years. There were 2 cases in the pediatric group not included in this study who refused to take the drug.

Table III reveals that 222 received the drug for a period not longer than five days. Of these, 146 received 80 mg./lb. Twenty-six patients were treated from 6 to 14 days and 2 patients for a period longer than two weeks.

SUMMARY AND CONCLUSIONS

1. Two hundred and fifty patients in the pediatric and adult age groups were given Chloromycetin Palmitate, a new palatable suspension of Chloromycetin.

2. This study represents group divisions as follows:

Table III
A CORRELATION OF DURATION OF THERAPY AND DOSAGE

DOSAGE	DURATION		
	1-5 Days	6-14 Days	14 or More Days
40 mg./lb.	48	6	0
80 mg./lb.	146	10	0
1-1.9 gms./24 hrs.	13	1	0
2-2.9 gms./24 hrs.	4	2	1
3 gms. or over	11	7	1
TOTAL	222	26	2

The largest number of cases, 148, were seen in the age group, one to five years; 89 between one and three years, and 59 between three and five years. Thirty-three cases were less than one year old, eight of which were under six months, leaving 25 in the group six to twelve months.

Reactions were noted in only three, or 1.2 per

respiratory, 212; dermatologic, 15; communicable diseases, 15; miscellaneous, 10.

3. A correlation was made relative to the age, dosage and tolerance, and, in addition, the dosage was also correlated with the duration of therapy.

5. Reactions were negligible and the palatability of the drug was excellent.

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MENTAL HEALTH

JOSEPH E. BARRETT, M.D.,
Commissioner, Department of Mental Hygiene and Hospitals

The Neurotic Patient*

One of the problems that faces almost every physician is presented by the relatively large number of patients who come to him with complaints in explanation of which he can find nothing on either physical or laboratory examination. He is not merely puzzled by them—he is frustrated, defeated and, far too often, angered. He wants to be helpful but there is nothing in his armamentarium of drugs and physical therapy that will help. The result is too frequently that the patient is dismissed with the diagnosis of "neurotic" or "hysterical", used unfortunately as a term of derision.

But we cannot dismiss these people so lightly. They are sick persons who come to their doctors for help. Can we turn them away? To do so is only to drive them to the irregular practitioner, the osteopath, the chiropractor or the faith healer. The giving of a placebo, or of some treatment merely for the sake of doing something, gives no relief and leads to the same result.

If we are to help these patients we must first of all recognize that emotional illness is real illness. Whether we call it neurosis, psychosomatic disease or conversion hysteria, it is sickness. The complaints which bring the patient to the doctor's consulting room are real. They are just as real as though they were on a physical basis and just as deserving of adequate and understanding care and attention. It is necessary to emphasize this point because a proper attitude on the part of the physician is absolutely necessary if help is to be given. Otherwise, there is great danger of doing more harm than good.

If harm to the patient is to be avoided, great care must be taken not to place him in a position where his self-respect is challenged and where he must needs prove more emphatically than ever that he is ill. A man or woman who is told that his illness is "imaginary" or "all in his head" takes such a statement as a challenge to his integrity and to his good sense. He knows that he has subjective symptoms. It is for help with them that he came to the doctor. To him they mean illness, even though he may have no recognition that the illness is emotional. When his integrity is challenged by the use of a derisive term, he must find an honorable way out. To be well would be an admission of something which he or others might regard as shameful. If, on the other hand, his illness becomes worse, his feeling that he is really sick is justified not only to others but also, and more important, to himself. It is the only way out without loss of "face". The physician who challenged the reality of the illness and forced this situation has thus actually made the patient worse rather than better. This is not good treatment.

If we are to take a rational attitude toward the neurotic patient, we must strenuously avoid thinking of him as a faker. The person who consciously claims symptoms which are not really present is a malingerer. He really is a fake. He is totally different from the patient suffering from a neurotic condition whose symptoms, whatever the objective findings may be, are subjectively very real and whose mental mechanisms are wholly unconscious. Nor would it be correct to say that even unconsciously the neurotic person has elaborated symptoms which aim to convince his family, his friends, his associates or even his doctor that he is ill. On the contrary, neurotic symptoms are primarily for the benefit of the patient himself. They are his method of meeting an intolerable situation, of compromising between conflicting needs. If he is "fooling" anybody, it is himself. Only the physician who understands this and accepts it as part of his thinking can be sure to avoid doing or saying something that will retard rather than accelerate the patient's improvement.

Many of the diagnoses of neurotic conditions are unsatisfactory because they are diagnoses by exclusion only. A patient comes to his doctor with complaints which might be based on one or more types of physical pathology. A thorough physical examination is made but no pathology is found of a nature to explain the subjective symptoms. Laboratory studies are then ordered, again without sufficient positive

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findings to explain the complaints. The busy practioner, not knowing what else to do, calls the illness neurotic. Having excluded physical pathology, he reasons, it must be emotional in nature. This is a diagnosis of a positive condition merely by exclusion. Is it adequate for good medical care?

The answer should be in the negative. A complete study of a patient suffering from a neurotic illness should lead to a positive diagnosis of the neurosis. This is not impossible, even for the physician who does not specialize in psychiatry. There are a number of possible findings which might lead to a positive diagnosis. One may be the nature of the patient's complaints. Those of the neurotic patient are often bizarre and unusual. They present an unusual picture, one that does not fit into any syndrome. Perhaps this may be illustrated by an extreme and rare example. An hysterical (conversion) anaesthesia or paralysis will involve not areas or muscles innervated from a common source such as a peripheral nerve or a spinal segment, but will involve instead a part of the body commonly thought of as a unit, such as a hand, an arm, a foot, etc. Another characteristic of the symptomatology of some of these patients is to be found in its variability. The complaints differ from visit to visit, or multiple complaints may easily be elicited by leading questions.

A still more adequate basis for a positive diagnosis of an emotional condition is the finding of an adequate cause. This means that the doctor must take the time to talk with the patient about his life, his problems, his worries and his hopes. Quite frequently, there will gradually appear a situation of great difficulty for the patient to which his illness has offered a solution. It is now possible to say that the illness is a neurosis because it definitely meets a neurotic need. In reaching such an understanding, however, the doctor must look at each situation from the patient's point of view, not from his own. We cannot safely assume that illness is worse for the patient than would be facing his problem just because this would be true for us. To many people there are far worse things than being sick, such as failure at one's job, unemployment, failure to make a success of marriage, social ostracism, and so on.

What can the doctor do to help these people? He will doubtless refer the more serious cases to someone with psychiatric training. However, there are not enough psychiatrists to care for all persons suffering from neurosis; they are beyond the means of many; and a large group of patients could not be induced to consult one. The general practitioner as well as the specialist in many fields sees the neurotic condition in its early stages when a little help may well prevent it from becoming more serious. The first step is scrupulously to avoid doing anything that will exacerbate the conditions. The need to keep from any statement that would challenge the patient's self-respect has already been mentioned. There is likewise danger in taking the symptoms too seriously. An overly long work-up with a multitude of laboratory studies may in the end convince the patient that he is a very ill person. Eventually, a state of chronic mental invalidism may be reached. This, unfortunately, is often a condition which is resistant to any type of treatment. A middle-of-the-road type of management is necessary.

On the positive side, real help may be given by providing the patient with an opportunity to talk fully and freely about himself and his anxieties, worries, feelings of guilt, etc., to a person in whom confidence is reposed. It is, of course, most important that the doctor's attitude be one of acceptance. No matter what the patient says, there must be no blame or censure. The physician never sits in judgment, but merely listens as a trusted confidante.

But, you may ask, is this a doctor's task unless he is a psychiatrist? The answer depends upon our conception of our responsibilities. If we are to relieve suffering, must we not help whenever and in whatever form we find it? Can we limit our ministrations to those who can be aided by drugs, surgery or physiotherapy? The psychiatrist seldom sees a neurotic patient until the illness has been aggrevated by the passage of time and has reached the point where therapy is difficult, time-consuming and expensive. Men in other fields, especially the family doctors, see these people in the early stages of the illness when a little help may well give relief. Failure to meet this challenge is a failure to do all that one can for the patient.

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PUBLIC HEALTH

MACK I. SHANHOLTZ, M.D.,
State Health Commissioner of Virginia

More Wonder Drugs Reported for Tuberculosis*

According to highly encouraging preliminary reports on dramatic clinical results obtained during the past six months with certain derivatives of isonicotinic acid in treatment of tuberculosis, it would appear that streptomycin and PAS, scarcely beyond the stage of "adolescence" themselves, must prepare to share the limelight, at least temporarily, perhaps in time, to be totally eclipsed, by these newly heralded "infant prodigies."

Seldom has there been so much talk about a subject concerning which so little is known. This is perfectly understandable, however, when one reflects upon the many, many weary years of wishful thinking humanity has directed toward ultimate discovery of a sure-cure for tuberculosis that could be taken like candy—as can these drugs.

As much as premature publicity is to be deplored, once a release of this character has become a "fait accompli", an obligation is placed upon those whose official responsibility is public health, to summarize available information and to attempt to evaluate published data in terms of significant accomplishment to date, and in the light of future potentiality, so that all may be in a position to regard the drugs objectively and perhaps in an at least somewhat more nearly correct perspective.

Activity of the new drugs, in the laboratory, in vitro and in vivo, as well as their early effect upon the clinical course of approximately 200 patients, has been summarized hurriedly by the Public Health Service and the National Tuberculosis Association, and by the producing drug firms. Formal detailed preliminary accounts on all phases of the several investigations underway will appear in the current (April) issues of the "American Review of Tuberculosis" and "Diseases of the Chest" to supplement a special issue of the "Quarterly Bulletin of the Sea View Hospital", dated January, 1952, devoted exclusively to this subject.

According to physicians at the Sea View Hospital, in New York, the most spectacular effect of the drugs is the striking improvements in symptomatology. In a group of 92 cases observed over a period of from 4-15 weeks, fever came down promptly (within two weeks) without exception; cough and expectoration disappeared or markedly diminished; appetite changed from poor to "ravenous"; amazingly, previously "toxicity-drugged" intestinal tracts and metabolic systems immediately responded to sudden deluges of food without faltering. Gains in weight of as many as 10 pounds in one week, 50 pounds in two months, were recorded (*all* patients had previously been losing weight steadily).

Sputum became converted by direct examination in 25% of cases, markedly reduced by Gaffky count in another 29%. Character and volume of sputum were also changed for the better.

Patients' strength returned—apparently converting whole wards from "bed-fast" to "ambulatory" status.

X-rays showed some clearing of resorbable pathology; however, only two cavities apparently closed out of approximately 30; one questionable cavity appeared at the site of a previous exudate.

Sinuses in extrapulmonary lesions closed or drainage greatly subsided.

The new drugs are not "sure-cures" in and of themselves—at least not for a large, perhaps major portion of cases as diagnosed and treated in the past, and which all too commonly are thought of today as "typical" of pulmonary tuberculosis, i.e., advanced, heavily communicable, with cavity, unresorbable caseation and all the trimmings.

No matter how tuberculocidal the drugs may prove to be, to an improbable point where the last tubercle bacillus has been liquidated in its host, there undoubtedly will remain a tremendous amount of "mopping up" to be done surgically upon known

*Rimi on and Marsalid—Hoffman-LaRoche. Nydrazid —Squibb.

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cases as well as upon thousands yet to be diagnosed. Some patients will never be restored physiologically by virtue of residual irreversible cardiac or respiratory deficiencies which have resulted *from* tuberculosis.

It has not been demonstrated that the cases so far studied have been rendered non-communicable (first cultures have yet to be reported on those whose sputum is no longer grossly positive). While reports indicate that it apparently has not always been possible to recover tubercle bacilli at autopsy from treated animals in the laboratory, the infection which must be overcome by therapeutic agents in *freshly* inoculated animals, is a very different problem from that of coping with chronically established foci of the re-infection type most commonly encountered in man, regardless of the stage of the disease in the latter. Moreover, experience generally has shown repeatedly that response to drugs in man does not necessarily parallel that in animals.

To date, nothing has been published on even the early effect of the drugs upon patients whose disease consists of lesions which are overwhelmingly exudative in type, whether primary or reinfection. These lesions have long been known to be completely "reversible", i.e., anatomically *capable* of total resorption almost without trace. Long term response of this group, and of minimal and/or early cases generally, will go a long way to provide the key to final evaluation of the drugs.

The drugs may be taken orally, are rapidly absorbed, and are readily excreted, mostly through the kidneys. Nothing is known about later toxic effects (insignificant to date), or possible ultimate development of resistant strains (none as yet noted), information about both of which should be ascertained as completely as possible, before the drug is released for general use.

Nothing could be more shortsighted and foolhardy (on the basis of present knowledge or in anticipation of that likely to be forthcoming in the next few months or years) than to let up by one iota full support, and planned expansion, of current tuberculosis eradication programs, predicated as they are upon presently known, time-tested procedures of diagnosis and treatment. There is plenty of room *now* for a new useful adjuvant to treatment. There will be plenty of time later to calmly, dispassionately, and intelligently readjust tuberculosis control programs in whatever direction and to whatever degree may be required to take maximum advantage of the emergence of a true specific, if and when such is found and *proven* to be as represented.

Dosages of the drugs have not been discussed because of lack of space and because the drugs are not yet available commercially. They will be reasonably priced.

MISCELLANEOUS

Virginia Public Relations Conference (State Chamber and Richmond PR Association)

A well-attended Virginia Public Relations Conference convened March 20, 1952, at the Commonwealth Club in Richmond. The Medical Society of Virginia was represented.

Keynoting this Thursday night session, Ed Lipscomb, Director of Public Relations for the National Cotton Council and President of the Public Relations Society of America, labeled the government "PR Job No. 1". Dismayed by the popular "What can I do?", Mr. Lipscomb emphatically subscribed to the belief that public opinion is the sum total of private opinion and urged every sincere citizen to conduct a public relations campaign in his own realm of influence. We demand government frugality until our personal pocket feels the pinch, concluded the public affairs expert.

With open forums and workshops scheduled, the conference moved to the Richmond Hotel Friday, March 21. Representatives of advertising, newspapers, radio, television, and industrial publications commented briefly on their respective experiences in dealing with public opinion. A multitude of audience questions served well to demonstrate the wide divergence of interests and concepts in the public relations field. Profound effectiveness of television as an opinion-molding medium was reported.

Experts dealt with various problems encountered in preparing materials for readable and impressive publications. Practical aspects of printing and engraving were also discussed.

The conference emphasized the increasing importance and need of sound public relations in virtually any business or professional undertaking.

WOMAN'S AUXILIARY TO THE MEDICAL SOCIETY OF VIRGINIA

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Southwestern Virginia Auxiliary.

The Woman's Auxiliary to the Southwestern Virginia Medical Society met at Maple Shade Inn, Pulaski, Va., April 3, 1952. Twenty-five present.

The president, Mrs. W. C. Caudill, Pearisburg, presided.

The routine business was transacted and reports of various committees given.

A committee was named to study the advisability of a Nurses' Scholarship Fund as a new project for the Auxiliary.

The guest speakers were Mrs. Herman Farber, President of the Woman's Auxiliary to The Medical Society of Virginia, who spoke on the organization and work of the Auxiliary, and Mrs. R. M. Reynolds, member of the National Speakers' Bureau, who gave the history of socialized medicine and our part in helping to combat it.

ANNIE E. COX (MRS. J. G.)
Recording Secretary

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BOOK REVIEW

Doctors in Blue; the Medical History of the Union Army in the Civil War. By GEORGE WORTHINGTON ADAMS. 1952. H. Schuman. New York. xii, 253 p. Illustrated. Price $4.00.

The Civil War came at the most uninteresting period of medical history. It is true that there was anesthesia, but there was no knowledge of bacteria. Surgeons spoke of laudable pus, and hygienists of effluvia and bad odors. When the war began, the Army Medical Department was practically non-existent and the lessons learned in the Crimean War were so recent that they caused confusion. Between the Sanitary Commission composed of civilians, the Surgeon-General, and the line officers of the Army, there was nearly always lack of agreement. Nevertheless, in the four years of the war there was developed a system of ambulance service and a great network of hospitals more imposing than anything seen up to that time. The author is a trained historian and has analysed the tremendous material at his disposal with judgment and restraint. He gives us a good picture of the defects of organization and policies, the jealousies and politics, the general unpreparedness, and the tremendous variation in medical personnel. The chapter on Dorothea Dix and her female nurses is especially interesting as is also that on diseases and treatment. In this pre-Listerian era, one is surprised to learn that disinfectants were used, but one gets the impression that their use was more as deodorants than for antisepsis. There was no evidence that instruments of the surgeon received any of the treatment. Both iodine and bromide were sprayed in the air but it is hardly likely that the surgeon or the scalpel in his mouth received any of the spray. One is surprised to see the name Dakin in the list of disinfectants.

An interesting experience with maggots is related. A group of Confederate surgeons who were attending gangrene cases in a prison stockade at Chattanooga were denied dressings and bandages. The unprotected wounds were fly blown and became infected with maggots. The maggoty Confederate wounds cleared up quickly while Union wounded protected from flies, died in large numbers. A similar experience had occurred in the Napoleonic Wars, but had been forgotten. The experience with maggots in World War I is fresh in our memory.

The author is to be commended upon this delightful little book that fills such a gap in military medical history.

M.P.R.

Statistics for Medical Students and Investigators in the Clinical and Biological Sciences. By FREDERICK J. MOORE, M.D., Associate Professor of Experimental Medicine, University of Southern California School of Medicine; FRANK B. CRAMER, B.A., Research Fellow; and ROBERT G. KNOWLES, M.S., Research Associate. The Blakiston Company, Philadelphia and New York. 1951. viii-113 pages. With 11 figures and 16 tables. Price $3.25.

The authors succeeded in writing a rather readable and comprehensible introduction into the difficult field of statistics with due emphasis on sampling distribution, tests of significance, and the problem of non-normal distributions. An appendix contains the needed mathematical formulae and the tables for F, t, and other statistical values. The title of the book is a little misleading since it is written in regard to those statistical problems arising mainly in pharmacological and therapeutical research. Many statistical problems in the wider field of medicine and biology are not mentioned at all.

E.F.

Handbook of Medical Management. By MILTON CHATTON, A.B., M.D., Instructor in Medicine, University of California Medical School, San Francisco; SHELDON MARGEN, A.B., M.D., Clinical Instructor in Medicine, University of California Medical School; HENRY D. BRAINERD, A.B., M.D., Assistant Clinical Professor of Medicine and Pediatrics, University of California Medical School, etc Second Edition. University Medical Publishers, Palo Alto, California. 1951. 508 pages. Price $3.00.

The "Handbook of Medical Management" by Doctors Chatton, Margen and Brainerd, second edition, should have a definite place for use by both practitioner and students of medicine. Its scope is unusually wide, practical and the authors have succeeded admirably in condensing a wealth of material into a clear outline for use as a practical, quick reference for the busy doctor who needs something to help him remember. By the same token, it should serve students as a means of review.

Impressive in such a work is the attention to the psycho-somatic aspects of disease and the absence of the shotgun type of prescription. Drugs suggested are based on an attempt to restore disturbed physiology or are otherwise specific.

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Though "styles" in therapy vary from place to place the handbook appears to be very well up-to-date, and one gets the feeling that it was written from a sound medical background and sufficient experience with practice to give the authors insight into the practitioner's problems and the best ways of solving many of them. A.B.G., JR.

Dynamic Psychiatry. Basic Principles. Volume 1. By LOUIS S. LONDON, M.D. Corinthian Publications, Inc., New York. 1952. vi-98 pages. Price $2.00.

The author attempts to give a brief outline of psycho-analytical theory, largely based on the Freudian system, but supplemented by his own thinking. The most important part of the book is a condensed account of the psychology of the libido. The libido, according to London, may be divided into four component parts: Heterosexuality, Homosexuality, Narcism, and the Deviations. In "treatment", we must first dissect the libido, cleanse it and then realign it. Dynamic psychiatry is concerned with the conflicts as they arise out of the battle between the instinctual drives and the superego.

The book will be best enjoyed and most profitably read by those who have already a knowledge of psycho-analytical theories. A.R.F.

The Battle for Mental Health. By JAMES CLARK MOLONEY, M.D., Philosophical Library, New York. 1952. x-105 pages. Price $3.50.

This small book contains a powerful appeal to improve on early mother-child relationships for the sake of sound mental health in the adult. Written by a prominent psychoanalyst, it addresses itself to obstetricians, pediatricians, nurses and other professions that are concerned with the welfare of the mother and her newly born child.

The author is one of the founders of the Cornelian Corner—a group devoted to the promotion of healthy parent child relationships. Mental health in the adult is characterized by appropriate spontaneity, by flexibility in adjusting to the demands of reality. The book emphasizes the importance of the first two years, even more the first days and weeks in the life of a baby to achieve adult mental health. The infant is utterly dependent on the mother and "senses the maternal climate." To bring about a relaxed and warm relationship the "rooming-in" method is recommended as a first and often decisive step towards the intimate and warm care that children need from their mothers. The need for more relaxing methods is illustrated by statistics on the mental and social illness in our culture. A thoughtful analysis of the resistance against the methods of the Cornelian Corner contrasts harmful and helpful attitudes —permissiveness versus competitiveness, relaxation and warmth against rigidity and impersonal regimentation. Special thought is given to ways in which the husband can be helpful to the mother and the new baby. Intelligent young parents may well profit from reading this book. A.R.F.

Antibiotic Therapy. By HENRY WELCH, Ph.D., Director, Division of Antibiotics, Food and Drug Administration, Federal Security Agency; and CHARLES N. LEWIS, M.D., Medical Officer, Division of Antibiotics, Food and Drug Administration. Foreword by CHESTER S. KEEFER, M.D., Wade Professor of Medicine, Boston University School of Medicine, etc. The Arundel Press, Inc., Washington, D. C. 1951. xiv-562 pages. Price $10.00.

This unique volume will prove a real asset to the library of any physician who uses antibiotics—and who doesn't? It is appropriate that the book is written by two men who have occupied a central position in the development and standardization of our newer chemotherapeutic agents through the Division of Antibiotics of the Food and Drug Administration.

The first section of the book is devoted to individual descriptions of the various antibiotics, their origin, production, pharmacodynamics, antimicrobial spectrum, and clinical application. The second half discusses the specific antibiotic therapy of infectious diseases—from viral through bacterial to protozoal. Full bibliographic references are included.

In assembling information from hundreds of references concerning the efficacy of antibiotics in various diseases, the authors appear to have attempted a cross-section of opinion, leaving critical appraisal to the reader. It is unfortunate that a chapter was not included to explain the faults and advantages of the sensitivity tests now in use, for their pertinence to clinical problems has become increasingly greater.

In the rapidly-changing field of antibiotics, today's best advice is quickly superseded by tomorrow's discoveries. Drs. Welch and Lewis are to be congratulated on the comprehensive text which they have assembled and it is to be hoped that this is the first of a long series of editions which will keep the medical profession perennially posted on the latest developments in antibiotics. C.D.G.

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EDITORIAL

Florence Nightingale (1820-1910)

ONE hundred years ago Britain was a hard place in which to live. The industrial revolution had crowded working people into cities, where housing conditions were inadequate and sanitation non-existent. The Public Health Act (1848) was the first evidence that the Government was aware of the terrible situation. The lot of the sick was pitiable. The hospitals for the sick poor (no one but the poor went to them) were notorious for their filth and their high mortality rate. What nursing care there was, was supplied by women of the type of "Sairey Gamp" of Dickens' *Martin Chuzzlewit*. Nursing training was non-existent. In the Crimean War (1845-1856) the British Army reached its nadir. Officers spoke of the enlisted men as brutes and treated them as such. With conditions, both civilian and military, as bad as they were, the stage was set for St. Filomena.

Florence Nightingale was born into a rich, neurotic, and highly gifted family. Her mother, Fanny Smith, belonged to a rich mercantile family of London and her father, William Edward Shore, changed his name to Nightingale at the age of 21 when he came into the fortune left him by his uncle. He went up to Cambridge with an income of seven to eight thousand pounds sterling, and developed into a dilettante—rich, aesthetic, indolent, and charming.

Fanny and W. E. N., as he was called, traveled extensively in Italy after their marriage in 1818. Their first daughter was born in Naples. As the time for her second confinement approached, Fanny chose Florence as the city for the event which took place on May 12, 1820. In 1821 they returned to England with two daughters and a fully developed social ambition.

When Miss Nightingale was 16, the family planned extensive alterations in their winter home, Embley Park, and while this architectual face lifting was in progress, they embarked on an eighteen months' trip to the continent. In the midst of the preparations for leaving home, Florence received a call from God. Unlike those of Joan of Arc, Florence's voices gave no specific directions, but subsequent events substantiate their authenticity. When she returned home eighteen months later, she was a beautiful woman, endowed with wealth, a brilliant mind and a charming and compelling personality, well qualified to take the place in society that her parents had planned for her. However, she was not happy. She had not found out what God wanted her to do. She was given to dreaming and to falling into trance-like states and of writing memos to herself. Nursing the children and the sick of the large family connections brought her happiness and she decided that He wanted her to work for the poor in the hospitals. But the English hospitals at the time were no place for a lady. The nurses were noted for immorality and drunkeness. There was no training and none was to be had. The most acceptable qualification was to have had a child. The best thing that Florence Nightingale could do under the circumstances was to make a study of hospitals both at home and abroad. She studied all available hospital reports and became an *expert*.

In the winter of 1849-50 she visited Egypt with friends. Two sisters of St. Vincent de Paul gave her introductions to their order in Alexandria and she inspected their schools and hospital. From the sisters she learned the importance of formal discipline in hospital nursing. She also visited the Institute of Protestant Deaconesses at Kaiserswerth on her way home. The following year she returned to Kaiserswerth and took a regular course of training as a nurse. The family quarrel over what she

Florence Nightingale

(Courtesy of Army Medical Library)

should do now became really acute. Finally, she found a berth to reorganize the Institution for the Care of Sick Gentlewomen in Distressed Circumstances. The Institution was moved to No. 1 Harley Street and Miss Nightingale was made the superintendent.

Things did not go well in the Crimean War for the British. The high command was shot through with inefficiency and hampered by red tape. There was no adequate provision made for taking care of the sick and wounded and Sir William Howard Russell, war correspondent for the *Times*, became a thorn in the flesh of the War Department. Sidney Herbert, the Secretary at War, wrote to Miss Nightingale, asking if she would take charge of the nursing at the barracks-hospital at Scutari. His letter crossed one from Miss Nightingale offering her services. The result was that on October 21, 1854 she set out with a staff of 38 nurses and arrived at Scutari on November 4th, in time to receive the Balaklava wounded. The conditions were unbelievably bad. The barracks-hospital was insanitary; there was no provision for serving food, no change of clothing for the wounded, no sewage disposal. The only thing they had on the positive side were overcrowding and a high mortality. The death rate in February reached 42%. The task of establishing diet kitchens and cleaning up the patients and the place was herculean, but she also had to contend with religious jealousies and bureaucratic inefficiencies. Frequently, she had to invoke the power of the press in order to carry out her task. By June the death rate had dropped to 2%. When peace came, and the last soldier had left Scutari, it was thought that her work was done. A Man of War was ordered to bring her home and London was prepared to give her a triumphal entry, but she returned quietly on a French ship and escaped to her home in Devonshire before her presence was made public. She had a sense of failure. The knowledge that some regiments had lost 78% from disease depressed her and she was determined that this should not happen again.

A fund of £50,000 had been raised in her honor and she devoted this to establishing a training school for nurses at St. Thomas's Hospital. She insisted on the careful selection of applicants for training with especial emphasis placed on character, and she took great interest in the careers of the graduates, but nursing training was no longer her chief interest. It had been replaced, to a large extent, by her interest in the welfare of the British soldier. Her health was shattered and frequently she was bedridden. Cecil Woodham-Smith, in her recent Biography (McGraw-Hill Book Co. Inc. N. Y. 1951), states that after Miss Nightingale's return from the Crimea she never made a public appearance, never attended a public function and never made a public statement. Yet her advice on hospital regulations and hospital construction and on sanitary matters generally was sought from all over the world; from Washington in the Civil War, from Canada when it appeared that the Dominion would have to invade the United States, on account of the Trent affair, from India at the time of the Mutiny. Queen Victoria wished to hear her story first hand, so it was arranged for her to visit Birk Hall, Sir James Clark's Highland place, for the sake of her health. Birk Hall is only a mile or two from Balmoral. She attended several command audiences at Balmoral and the Queen paid her several private visits at Birk Hall.

Florence Nightingale was completely unself-seeking and this added power to the world-wide campaign in behalf of the common soldier, which she managed from her bedside. She took a housekeeping suite in a London hotel and ministers and prime ministers came to her for information and advice. She briefed viceroys before they set off for India. In her *Notes on Matters Affecting the Health, Efficiency and Hospital Administration of the British Army* (1858), she called attention to the bad liv-

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ing conditions in the barracks of the British Army in peace time. As an example she compared the mortality rate in the parish of St. Pancras, 2.2 per 1000, with that of the barracks of the Life Guards situated in St. Pancras of 10.4 per 1000, and the civil rate of 3.3 in Kensington with the rate in the Knightsbridge barracks, situated within the borough, of 17.5. The work of the Royal Sanitary Commission on the Health of the Army in India dragged, and she spent £700 of her own money in printing reports and statistics for it. Her *Notes on Hospitals* which appeared in 1859 brought her more responsibilities. The plans for the Birkenhead Hospital, the Edinburgh Infirmary, The Charlton Infirmary, the Conventry Hospital, the Infirmary at Leeds, the Royal Hospital for Incurables at Putney, the Staffordshire Infirmary and the Swansea Infirmary were submitted to her. The Government of India officially consulted her on the plans for the new General Hospital at Madras. The Crown Princess of Prussia and the Queen of Holland submitted hospital plans and the King of Portugal asked her to design a hospital in Lisbon. With the help of Dr. William Farr she drew up model forms for hospital statistical reports.

In 1865 her family bought for her a house on South Street, and in October she moved from the Burlington. The back of her house opened on to the gardens of Dorchester House and her physical surroundings were more pleasant. However, her manner of life continued as before, with no let up in her work except that demanded by actual physical infirmities and here she died August 13, 1910. Her bibliography prepared by Cecil Woodham-Smith gives some idea of her activities.

The Institution of Kaiserswerth on the Rhine for the Practical Training of Deaconesses under the direction of the Rev. Pastor Fliedner, embracing the support and care of a Hospital, Infant and Industrial Schools, and a Female Penitentiary. Printed by the Inmates of the London Ragged Colonial Training School, 1851.

Letters from Egypt, Privately printed, 1854.

Statements Exhibiting the Voluntary Contributions Received by Miss Nightingale for the Use of the British Hospitals in the East with the Mode of their Distribution, in 1854, 1855, 1856. Harrison and Sons, 1858.

Notes on Matters Affecting the Health, Efficiency, and Hospital Administration of the British Army. Founded Chiefly on the Experience of the Late War. Presented by Request to the Secretary of State for War. Privately printed for Miss Nightingale. Harrison and Sons, 1858.

Subsidiary Notes as to the Introduction of Female Nursing into Military Hospitals in Peace and in War. Privately printed for Miss Nightingale. Harrison and Sons, 1858.

A Contribution to the Sanitary History of the British Army during the Late War with Russia. Harrison and Sons, 1859.

Notes on Hospitals. John W. Parker and Sons, 1859. 3rd edition, almost completely rewritten, 1863. Longmans, Green and Co.

Suggestions for Thought to the Searchers after Truth among the Artizans of England. Privately printed for Miss Nightingale. 3 vols. Eyre and Spottiswoode, 1860.

Notes on Nursing: What it is and what it is not. 2nd ed. Harrison and Sons, 1860.

Army Sanitary Administration and its Reform under the late Lord Herbert. M'Corquodale and Co., 1862.

Observations on the Evidence Contained in the Stational Reports Submitted to the Royal Commission on the Sanitary State of the Army in India. (Reprinted from the Report of the Royal Commission), Edward Stanford, 1863.

Introductory Notes on Lying-in Institutions, Together with a Proposal for Organizing an Institution for Training Midwives and Midwifery Nurses. Longmans, Green and Co., 1871.

On Trained Nursing for the Sick Poor. The Metropolitan and National Nursing Association, 1876.

Miss Florence Nightingale's Addresses to Probationer-Nurses in the "Nightingale Fund" School at St. Thomas's Hospital and Nurses who were formerly trained there, 1872-1900. Printed for private circulation.

Florence Nightingale's Indian Letters. A glimpse into the agitation for tenancy reform. Bengal, 1878-82. Edited by Priyaranjan Sen. Calcutta, 1937.

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A Lady with a Lamp shall stand
In the great history of the land,
A noble type of good
Heroic womanhood.
Nor even shall be wanting here
The palm, the lily, and the spear,
The symbols that of yore
Saint Filomena bore.

LONGFELLOW

Present Day Training for Nurses

IT IS A far cry from the four months training course (including scrubbing floors) that Florence Nightingale took at Kaiserswerth, and the present day three year training course with a state board and nation-wide examinations that are graded by machines. Sometimes one wonders if we have not progressed too far and too fast. To form a correct judgment on this question one must know what is expected of a nurse today.

Not only have the fields of opportunity for the trained nurse become more numerous, but the modalities have become more complicated. She may be called upon to help with an intraspinal medication, to give fluids or medicants intravenously or supervise an oxygen tent, a Miller-Abbott tube or a Wangensteen apparatus, an incubator or a pulmometer. The psychiatric patient and the extremes of life, the premature baby and the aged, require special skills.

Just as the doctor may enter one of the many specialties, so the nurse may go into office nursing, district nursing, public health or school nursing, industrial nursing, physiotherapy, or teaching, and administration. Regardless of what she eventually does, the one thing that distinguishes her from all the rest of the world is her ability to take care of a sick person. Nothing should interfere with the development of this quality. Whether the training in the nursing specialties should be included in the average training school is questionable. In medicine the specialists have their post-graduate courses and it would seem logical that a similar plan for nurses would be more economical and would result in more good bedside nurses, which is the crying need at the present time.

Miss Nightingale stressed the importance of character as well as the acquisition of knowledge. The former was to be insured by careful selection of the probationer and by progress reports and the latter by examinations. Today when technics in therapy have become more numerous and more complicated the nurse is put to severer tests but nothing justifies spoiling a good nurse in an effort to qualify her for an academic degree. In training nurses, as well as in training doctors, contact with the patient is of prime importance—yes, essential. This should always be borne in mind when arranging the curriculum to meet the increased requirements of the modern nurse.

To meet these increased requirements the curriculum has been overcrowded. More and more use has been made of classroom instruction and less and less of clinical instruction. The result is that the present day graduate nurse does not give as good bedside care as the nurse of the preceding generation, nor for that matter as good special care. We hear of more dreadful and even fatal accidents in hospitals than ever before. We believe that those who are responsible for the curriculum of the nurse's training schools should concentrate on the problem of graduating nurses to whom the carrying out of the doctors orders can be safely entrusted and who can also make the patient comfortable. All else is secondary.

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Historical Items

At the request of the Council, the members of The Medical Society of Virginia are petitioned to contribute any documents, photographs, mementos, or other items of historical interest in connection with The Society or the VIRGINIA MEDICAL MONTHLY. These items will eventually be placed on display at 1105 West Franklin Street, Richmond, Virginia.

Among the objects of great historical interest long sought by the Society is the seal struck in 1870 at the time of the reorganization of The Medical Society of Virginia.

L.H.B.

Southern Pediatric Seminar

OUR friend, Julian Price, Editor of the Journal of the South Carolina Medical Association, has sent us the following description of the Southern Pediatric Seminar.

The 1952 session of the Southern Pediatric Seminar will be held in Saluda, N. C. from July 14 through July 26. This is the thirty-first annual session of this institution which has become one of the outstanding postgraduate courses in pediatrics in the country. Following the plan which was put into effect last year, there will be an additional week (July 28 through August 2) devoted to the study of Obstetrical and Gynecological problems.

The Seminar was established and is maintained for the benefit of the general practitioner. Outstanding teachers and clinicians from the various southern states come, at their own expense, to give lectures, clinics, clinical-pathological conferences, and demonstrations. The meetings are of an informal nature and there is ample time to present special subjects and questions for discussion. General practitioners from Virginia to Florida to Arkansas who have attended the Seminar can attest to its value.

Held at Saluda, which is in the mountains of North Carolina, many of the physicians bring their wives and families with them and make the occasion a joint period of study and vacation. Such a plan is encouraged by the leaders of the Seminar and every effort will be made to secure accommodations for those who might desire to do this.

The course given at the Seminar is fully accredited for postgraduate requirements in the Academy of General Practice.

Those who are desirous of further information should write to Dr. D. L. Smith, Registrar, 187 Oakland Avenue, Spartanburg, S. C.

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SOCIETIES

The Fairfax County Medical Society

Met on March 11th at the home of Dr. Gerard J. Inguagiato. Two new members were admitted, bringing the total membership to twenty-eight.

Dr. Jack Levine gave an informative and timely talk on air problems in general practice.

A committee has been appointed to study the availability of physicians in the county for night calls and to make appropriate recommendations for making such service complete for every section in the area.

It was voted to turn over to the Arlington Hospital as a gift a Series F Government bond, par value $100.00, owned by the Medical Society, to be used toward the building fund for the hospital.

Dr. Kennedy, the new Fairfax County Health Officer, was present to meet the group.

Arrangements are to be made by the Health Department for necessary eye examinations for all school children who are financially unable to consult a private specialist.

The next meeting was scheduled for the second Tuesday in April at the home of Dr. Nelson Podolnick, in Falls Church.

Refreshments were served by Mrs. Inguagiato and Mrs. Paul Kemp.

ALICE H. KIESSLING, M.D.
CLAUDE COOPER, M.D.
Publicity Committee

The Buchanan-Dickenson and Tazewell County Medical Societies

Held a clinical session April 17, at Grundy, under the auspices of The Department of Clinical and Medical Education of the Medical Society of Virginia.

The program was presented as follows by members of the faculty of the Medical College of Virginia:

The Use of the Antibiotics—Count D. Gibson, M.D., Assistant Professor of Medicine

The Skin Diseases of Children other than the Exanthemata—R. Campbell Manson, M.D., Assistant Professor of Clinical Dermatology and Syphilology

The Differential Diagnosis of Chest Pain—Harry Walker, M.D., Professor of Clinical Medicine

A Discussion Period followed.

The Wise County Medical Society

Met in Norton, February 13th. After a social hour and dinner, the staff of Southwestern Virginia Hospital had the scientific program, all on mental problems. The head of the institution, Dr. Joseph R. Blalock spoke on Recent Developments, Dr. Lewis E. Jarrett, a Case of Parkinsonism, Dr. James E. Dean, Multiple Approach to a Homicide, and Dr. B. E. Barringer discussed the above.

Dr. James T. Phillips of Norton was elected a new member.

Following officers were elected for a year: President, Dr. G. C. Sneed, Derby; Vice-Presidents, Dr. D. C. Keister, Appalachia, and Dr. L. E. Ball, Big Stone Gap; Secretary-Treasurer, Dr. T. J. Tudor (re-elected), Norton.

Dr. J. J. Porter, Appalachia, was elected to Board of Censors, replacing Dr. E. J. Benko, whose three years service was ended.

The next meeting will be on May 14th at Norton. A urologist and cinema are scheduled.

T. J. TUDOR, *Secretary*

Roanoke Academy of Medicine.

At the regular meeting of the Academy on April 7, in the ballroom of Hotel Roanoke, the following program was presented:

The Clinical Use of Histamine—Dr. Bayard T. Horton, Mayo Clinic, Rochester, Minnesota

The Story of Cortisone—Dr. Edward C. Kendall, Princeton University, Princeton, New Jersey.

Dr. Ira H. Hurt is president of the Academy and Dr. Philip C. Trout secretary.

Richmond Academy of Medicine.

A case report on Tuberculous Meningitis by Drs. Gordon Hall and Hubert Dugan was given at the April 8 meeting, and a paper on The Diagnosis and Tetralogy of Fallot by Drs. Lewis Bosher, Jr., Carolyn McCue, Reno R. Porter and William E. Pembleton.

Dr. Guy W. Horsley, is president of the Academy.

Lynchburg Academy of Medicine.

At the March meeting of this Society, the guest speaker was Dr. Edward P. Cawley, professor of Dermatology at the University of Virginia. His subject was "Recognition and Treatment of Pre-

Cancerous and Cancerous Dermatosis". No important business was transacted at this meeting.

Edward A. Harper, *Secretary.*

The Alexandria Medical Society

Had their third annual Clinic Day on April 27th. At this time an excellent program was given in cooperation with the faculty of the University of Maryland.

Virginia Neuropsychiatric Society.

At the annual meeting of this Society in Charlottesville on April the 11th, Dr. James B. Funkhouser of the Veterans Administration Hospital, Richmond, was elected president, succeeding Dr. R. C. Longan, Jr., of Richmond. Other officers elected at this time were Dr. Frank Strickler of Roanoke as vice-president, and Dr. Granville Jones, superintendent of Eastern State Hospital, Williamsburg as secretary. In addition to the officers, Dr. Patrick H. Drewry of Richmond and Dr. Richard W. Garnett, Jr., of Charlottesville were named for the executive committee.

South Piedmont Medical Society.

The officers of this Society elected at a recent meeting are: President, Dr. Charles W. Haden, Evington; vice-presidents, Dr. John W. Hooker, Danville, Dr. C. B. White, Halifax, and Dr. Joseph W. Houck, Lynchburg; secretary-treasurer, Dr. William J. Hagood, Clover.

NEWS

Scientific Exhibits.

Dr. Eugene L. Lowenberg, Chairman of the Committee on Scientific Exhibits, announces that the Committee will now receive applications for scientific exhibits for the meeting of The Medical Society of Virginia to be held in Richmond, September 28th through October 1st. The deadline for applications will be June 15th. The executive committee will then choose those to be shown and notify the exhibitors by July 1st. This will be necessary because of limited space at disposal for scientific exhibits. Applications should be requested from Dr. Hunter B. Frischkorn, Jr., 1000 West Franklin Street, Richmond 20, Virginia.

Hospital A Reality.

The Richmond Eye, Ear, Nose and Throat Hospital at 408 North 12th Street, Richmond, will open its doors for patients on May the 12th. More than seventy gifts (some of them quite large) have made it possible for the hospital to start in a strong financial condition. About thirty-five physicians will practice there.

A basement and sub-basement house certain laboratories, the kitchen, storage rooms, etc.; on the first floor are administrative offices, operating and examining offices; the second and third floors will care for forty-six patients; and the medical record rooms and interns' quarters are at top of building in a penthouse arrangement. All equipment will be of the most modern type.

Dr. Rudolph Thomason is president of the hospital and the vice-presidents are Drs. E. Trible Gatewood and S. M. Cottrell. In addition to these, other members of the board of directors include: H. H. Augustine, Dr. W. Wallace Gill, George E. Haw, Dr. L. Benjamin Sheppard and Dr. B. Randolph Wellford of Richmond, and Dr. John W. Burke of Washington, D.C.

Changes in State Health Department.

Dr. A. L. Carson, Jr., until recently director of the State Health Department's division of specialized medical services, has been appointed director of the division of local health services by State Health Commissioner Shanholtz.

Dr. L. L. Shamburger, has been named head of the division of specialized medical services, succeeding Dr. Carson. Dr. Carson has been connected with the State Health Department since 1931 and Dr. Shamburger since 1936.

Johnston-Willis Hospital to Have New Nurses' Home.

A new Nurses' Home is to be built by this hospital in order to expand its nurse training program. This will be on the block below the hospital and will be a three-story building. It is expected that at

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least part of the building will be ready for occupancy in September.

General Practice Postgraduate Training.

The General Practice Group of the University of Tennessee has established a postgraduate clinical training program for general practitioners. This has been approved by the American Academy of General Practice for its members.

The program is designed for the general practitioner on an individual basis, according to his individual needs. One week to one month of training is offered. Each doctor will spend morning hours in his choice of any one of the University specialty fields. This will be active work at the resident level. The afternoons will be spent in the General Practice Clinic where the medical students get active general practice experience. Evenings are utilized in the emergency room of the John Gaston Hospital which is supervised by members of the General Practice Staff.

General practitioners who would like to participate or who desire further information, may write to the General Practice Office, University of Tennessee, Memphis, Tennessee. There is no fee charged for this training.

University of Virginia, Department of Medicine, News.

A new auditorium, first of three medical school additions to be completed, was officially dedicated by Dean Vernon W. Lippard at the opening of the Friday Evening Medical Lecture, March 14.

The auditorium, with a seating capacity for 240, occupies the two lower levels of a five story addition to the Department of Medicine. It is equipped with modern facilities for lighting, ventilation and audio-visual education.

On each of the three upper floors of the addition is a classroom with seating capacity for 100 students. Other buildings nearing completion are a six-story laboratory building and a cancer unit.

Dr. Harvey B. Haag, Professor of Pharmacology of the Medical College of Virginia, was guest speaker on March 14, and one of a series of distinguished medical authorities who have given lectures at the Department of Medicine on twenty Friday evenings during the year. Dr. Haag spoke on the pharmacological effects of nicotine and tobacco.

Dr. Manfred Guttmacher, Chief Medical Officer of the Supreme Bench of Baltimore, Md., spoke March 21.

Dr. Reuben Kahn, member of the faculty of the University of Michigan Medical School, lectured March 28, on the universal seriological reaction in health and disease.

A postgraduate conference on "Infectious Diseases", last of a series for general physicians of the State during the academic year, was held April 18, at the University of Virginia.

Guest speakers were Dr. Harrison F. Flippin, Chief of the Section of Infectious Diseases and Associate Professor of Medicine at the University of Pennsylvania Schools of Medicine, and Dr. George T. Harrell, Jr., Professor of Medicine at Bowman-Gray School of Medicine. Dr. Flippin spoke on "Management of the Pneumonias, with Special Reference to Complications" at the afternoon session of the conference. Dr. Harrell lectured on "Rocky Mountain Spotted Fever" in connection with the Friday evening Medical Lecture Series.

Dr. E. G. Gill,

Roanoke, recently returned from New York where by invitation he addressed the Annual Post-Graduate School in Ophthalmology which was conducted by the New York Polyclinic Medical School and Hospital. Dr. Gill's subjects were "Recent Advances in Cataract Surgery" and "The Surgical Treatment of Glaucoma".

Duke to Give Postgraduate Course.

Duke University, Durham, N. C., announces a Postgraduate Course to be given June 16, 17, 18 and 19. Registration fee will be $25.00. The meetings will be held in the Duke Hospital Amphitheatre. The evenings of the first two days will be spent in informal round-table discussions, patients to be presented if possible. On the evening of the 18th, the group and faculty will be entertained at an informal barbecue. Ward rounds will be given on the various services each afternoon.

Detailed information as to the course, rooms and meals may be obtained from Dr. W. M. Nicholson, Director of Postgraduate Education, Duke University School of Medicine, Durham, North Carolina.

Anesthesiology Program Approved.

The Residency Program in Anesthesiology at the University of Virginia Hospital was approved the

middle of March by action of the Council on Medical Education and Hospitals in concurrence with the American Board of Anesthesiology.

Winthrop-Stearns Opens North Carolina Sales Office.

Winthrop-Stearns Inc., has opened a new professional service office in Raleigh, North Carolina to function as sales headquarters in the surrounding area, with E. T. Meyers as manager.

Territory covered by the new branch includes the entire state of North Carolina and parts of Virginia, West Virginia and Tennessee.

The Society for the Prevention of Asphyxial Death

Is in its sixth year of sponsorship of courses in resuscitation. The June class is to be on the 6th and 7th of that month. While the course is given regularly in New York City the first Friday and Saturday of each month, out of town classes have met in other cities. Requests for out of town courses will be considered where application is made by a group of at least twelve students. For information, write Secretary, S.P.A.D., 2 East 63rd Street, New York City 21.

The Elizabeth Buxton Hospital,

Which has operated in Newport News since 1906, has been sold to the Bernardine Sisters of the Third Order of St. Francis. The change will become effective May 15 at which time the name will be the Mary Immaculate Hospital. It will continue to be operated as a general hospital on a non-sectarian basis.

The hospital was founded by Dr. Joseph T. Buxton, father of the present owner, Dr. Russell Buxton who plans to continue his work at the hospital as long as needed and who will also maintain his private work.

"Cancer Quiz"

Do You Know That Cancer Is:

a. marked by "Seven Danger Signals" which should be known by everyone; the sore that does not heal, a lump or thickening in the breast or elsewhere, any unusual bleeding or discharge, any change in a wart or mole, persistent indigestion or difficulty in swallowing, persistent hoarseness or cough, any change in normal bowel habits.
b. considered curable in its early stages when treated properly—x-ray, surgery or radium.
c. always fatal if untreated.
d. seldom painful in its early stages.
e. controllable by regular physical examinations by your doctor—twice yearly for women over 35, and yearly for men over 50.
f. a major threat to American business because it threatens one in every eight business executives, employees and customers at the very peak of their usefulness.

Your most powerful ally against cancer in your knowledge of the disease.

AMA Pays $20,000 in '52 for Chronic Illness.

The AMA has pledged continued financial support to the Commission on Chronic Illness in the amount of $80,000 to be paid over a four-year period. The Commission, an independent national agency, is conducting an intensive study of chronic illness—one of the most important health problems in America today. This year's installment of $20,000 was recently turned over to the Commission. A $300,000 budget set by the Commission for the coming four-year period has been met by twelve contributing organizations.

Portrait of Dr. Johns.

On April 19, a portrait of Dr. Frank S. Johns of Richmond was presented to Hampden-Sydney College with appropriate exercises. This was given by Dr. Donald Daniel, a long-time friend and associate.

Wanted—

General practice office equipment, including instruments. Address Edward J. Stoll, M.D., Sewickley Valley Hospital, Sewickley, Pennsylvania. (*Adv.*)

Medical Resident Wanted.

Beginning July 1, fully approved 165-bed general hospital has opening for Medical Resident. Stipend $150 a month and maintenance. Address "Medical Director, C. & O. Hospital, Huntington, West Virginia." (*Adv.*)

Full Time Medical Directors

To handle medical civil defense problems arising in each regional geographical area are needed. The states included in Region 2 are Pennsylvania, Maryland, Virginia, West Virginia and North Carolina.

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The job pays $10,800 per year. Any one in the above named states interested should write H. R. Battley, Southern States Building, 7th and Main Streets, Richmond 19, Virginia, for requirement and details.

Wanted—

Associate physician (general practice) drawing account plus commission; rapid advancement; twenty miles from Richmond. Write P. O. Box 257, Providence Forge, Va. Phone 541. *(Adv.)*

OBITUARIES

Dr. R. A. Quick.

The Arlington County Medical Society and the staff of the Arlington Hospital, in joint session February 21, passed the following resolution:

Ralph Andre Quick was born in Ashburn, Virginia. His medical education was obtained at George Washington Medical School where he graduated with honors in 1908 and began to practice in Arlington County. He offered his services to the Army in 1917 but was declined on account of physical disability resulting from typhoid fever. He thereupon volunteered and entered the Red Cross service and served as pediatrician in France throughout the war.

Following his return from France in 1918, until his death, he practiced in Arlington County earning the love and confidence of a large clientele and the esteem of the Medical Profession.

The Arlington Medical Society and the Governing Staff of Arlington Hospital met in joint session February 21, 1952 and passed the following resolution:

WHEREAS the passsng of Dr. Ralph Andre Quick, has removed from our fellowship one of our best loved members,

BE IT RESOLVED that we feel that the community and the Medical Fraternity has suffered an irreparable loss in the death of this esteemed and distinguished practitioner.

BE IT FURTHER RESOLVED that a copy of this resolution be sent to Mrs. Quick and the VIRGINIA MEDICAL MONTHLY.

S. T. NOLAND, M.D.
W. C. WELBURN, M.D.

Dr. Quick died January 20. He is also survived by two sons.

Dr. Thomas H. Worrell,

Hillsville, for many years a member of The Medical Society of Virginia, died unexpectedly on February 23 at the age of 67, apparently as the result of a heart attack. He was a graduate of the Baltimore Medical College in 1912 following which he interned in Maryland General Hospital. After a short time in Carroll County, he located in Mount Airy, N.C. Upon retirement several years ago he returned to Carroll County. His wife survives him.

Dr. William Strother Snead,

For thirty-five years a practicing physician of Newport News, died April 3rd at a local hospital there. A native of Louisa County, he was sixty-six years of age and a graduate in medicine from the Medical College of Virginia in 1911. He had been a member of The Medical Society of Virginia since 1915. He is survived by three children.

Dr. John Randolph Perdue,

A native of Rocky Mount, Va., living at Miami Beach, Fla., died March 27 at the age of 43. He graduated in medicine from the University of Virginia in 1932 and had specialized in obstetrics and gynecology. He is survived by his wife, the former Dr. Jean Jones of Petersburg, Va., and two daughters.

Dr. Harrie Maxwell Quackenbos,

Clinical director at Lynchburg State Colony, died March 31 after an illness of several months. Before coming to the Colony in 1949, he was on the staff of the Trenton State Hospital in New Jersey. He was sixty-three years of age and a graduate of Jefferson Medical College, Philadelphia, in 1914. His wife and three sons survive him.

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